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THE ROLE AND IMPACT OF EXTENSION AGENTS IN KADUNA STATE OF NIGERIA

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The role and impact of extension agents in Kaduna State of Nigeria

by

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CHAPTER I. INTRODUCTION

Agriculture has been recognized as the most important sector of the economy of developing countries. Developments in this sector have, therefore, frequently attracted attention of governments, scholars, and citizens of these countries as well as international organizations from developed countries.

This has been particularly true in Nigeria where declining productivity and rising population in the last two decades have led to a growing concern over the requirement and opportunity for agricultural development. In response, the government has established a number of agricultural development programs, research centers, and capital intensive agricultural schemes as systematic efforts to raise production. In addition, the World Bank has been brought into the scene and has established integrated rural development projects in many parts of the country.

However, far less effort has been invested in research to design and implement effective extension programs that are appropriate to the needs of the masses of peasant farmers. These farmers are producers of the bulk of the country's food and raw materials.

This study examines the role and the impact of extension agents in Kaduna State of Nigeria. In particular, the agent's role perception, role consensus, role performance, impact on agricultural and rural development, and factors influencing these are the major issues of investigation in this study.

Statement of the Problem

Basically, planned agricultural development involves three systems, namely; innovative, communicative, and practitioner systems (Coughenour, 1968). The innovative system is responsible for generating or adapting new technologies, the communicative system disseminates the technologies to the practitioner and the practitioner utilizes the technologies to improve his/her quality of life.

In this development chain, the responsibility of the communicative system is critical in terms of its linkage position between the innovative and the practitioner systems. Thus, the success of development efforts would depend largely on the efficiency and effectiveness of the communicative system in disseminating new technologies and providing adequate feedback to the innovative system for further research and necessary modifications. The communicative system can also play a major role in identifying problems of farmers and communicating them to the innovative system.

Agricultural extension in developed countries is an important communication system. Although it has great and obvious potential contribution for agricultural and rural development in developing countries, agricultural extension seems to be relatively ineffective. It has been widely accepted that the performances of agricultural extension systems in developing countries have fallen short of expectations (Schultz, 1967; Kincaid Jr., 1968; Nyerere, 1968; Freire, 1974; Lele, 1975; Kingshotte, 1980; Iwueke and Findlay, 1980; Nweke, 1981; Akinbode, 1982; Wang, 1983; Moore, 1984). A general impression has

been created that extension systems in developing countries are 'sick babies' which have not been able to generate much adoption of improved agricultural technologies and improvement in agriculture and rural life. In Kaduna State of Nigeria, for example, the few studies conducted there (e.g., Voh, 1979 and Atala, 1980) found a wide gap between awareness and adoption of improved agricultural technologies among farmers in the state.

This situation suggests that the role performance of extension agents is problematic and contributes to the general malaise in Nigerian agriculture. One of the key issues in the effectiveness of Nigerian agricultural extension is role impact. The roles and impacts of extension agents' activities are highly varied and often ineffective. The question becomes one of explaining the differential roles and impacts. This provides the rationale for focusing on the extension delivery system.

The situation further suggests that deficiencies in the extension system are explainable from a role-theory perspective, in which case an organization theory perspective is also warranted. Both role and organization theories offer the conceptual tools for appreciating the problems and potentialities of the extension agent/agency. They may, therefore, also reveal where effective intervention might be indicated.

Unfortunately, in spite of the low impression about extension systems in developing countries, extension work has received little attention (Williams, 1978). The primary reason seems to be the lack of understanding of the need for it (Umali, 1972).

In Nigeria, not much scientific research has been done in agricultural extension to identify the problems and to find solutions to them. Rather, studies in agricultural extension and rural sociology have tended to concentrate attention on adoption behavior of farmers while overlooking the actual performance and the impact of the extension agents and the extension organization itself. This study stresses the need for studies beyond adoption and diffusion. Specifically, the role and role impact of the extension agent have not been systematically studied. Therefore, it is still unclear what the role, the role performance, and the impact of the extension agent are and the degree to which these are affected by related factors.

The Funtua Agricultural Development Project

In the continuous effort to improve agricultural production in Nigeria, the Funtua Agricultural Development Project was established in 1975. This project was financed by a World Bank loan (51%) and funds from Kaduna State and federal governments (Ukpabio, 1978). The major objective of the project was to develop rural areas and improve agricultural productivity mainly by promoting adoption of improved agricultural technologies through extension activities. The project developed an intensive extension system in terms of its service activities, training and the extension agent/farmer ratio. This model was to be extended in the second phase of the project, five years later, to cover the whole state.

The statewide extension of the project took off in April 1980.

However, while very little independent, empirical study of the impact of the project in the initial project area in Funtua has been done, the impact of the project outside Funtua project area has so far not been studied. Yet, a study of this kind is of great importance not only because a statewide improvement in agricultural production and rural welfare was the ultimate goal of the project but also because similar projects have recently been established and more may continue to be established in several parts of the country with little or no available scientific lessons from the Funtua prototype project. Therefore, three fundamental research questions may be raised: What are the roles of extension agents of the Agricultural Development Project (ADP)? What is the extension impact of the ADP in Kaduna State? What are the constraints and potentials of the ADP extension system? A study in an area covered by the second phase of the Funtua project, rather than in the original trial project area, may be quite appropriate in providing answers to these questions.

Objectives of the Study

The main purpose of this study is to examine the role and impact of extension agents in Kaduna State of Nigeria. The general objective of the study is to better understand and explain the roles and impact of the extension agents and the problems related to such roles and impacts.

The present study has three major objectives. The first is to evaluate the impact of agricultural extension agents. Specifically,

it examines whether the role performance or activities of extension agents have made a difference in agriculture and rural life.

A second objective is to identify the role of the extension agent. Specifically, role perception, role consensus, and role performance of extension agents are examined.

The third objective of this study is to develop and test the importance of a set of variables posited or presumed as explaining differential agent role performance and role impact. The proposed model is synthesized from a role theory framework and organization theory perspective. The conceptual and empirical factors that lead to role impact of extension agents are identified in the model. The variables in the model have been identified in previous studies of agent roles and/or performances of organizational participants. Especially critical is the need to measure the differential significance of the explanatory variables (e.g., as is accomplished here through use of path analysis).

Significance of the Study

Basically, this study is undertaken to provide data and analytical guidelines for understanding and improving the performance of agricultural extension in Kaduna State. The study may also have implications for Nigeria in general.

Scientific information about the extension agent's role is generally scanty. Specifically, there is a paucity of data on the perception, the performance and the impact of extension agents' roles. Factors influencing agent's perceptions, consensus, performance and impact are largely speculative. Also, no indications of their varied significance and their interrelationships have been provided. There is, therefore, a research information gap.

Research information on these aspects would help in understanding some of the problems and challenges faced by agents. Such information is essential for a proper assessment of the needs and potential of the extension agents and the farmers they serve. It could also form the basis for improving the quality of extension work and agricultural communication and subsequently, farmers' adoption of improved technology and agricultural development.

Thus, the findings of the study may have policy value. In this sense, policies and planning designed with respect to the research data and analysis, in terms of which variables to manipulate and where to give priority, should help in improving extension agents' performance and benefit the farmers subsequently.

Dissertation Overview

The study has both theoretical and applied implications. At the theoretical level, the study tests a model of role impact. At the applied level, extension agents' role is evaluated as an intervention strategy for improving role performance and role impact.

The dissertation has six chapters. Chapter I describes the need for this research and provides a statement of the problem, including a summary of the three objectives of the study.

Chapter II presents an overview of agriculture and extension background and the current situation leading to the need for the present research.

In Chapter III, the theoretical framework for the study is developed. The model is formulated from the role-theory framework (e.g., Gross et al., 1958; Biddle, 1979) and organization theory perspective (e.g., Scott, 1981; Kanter and Brinkerhoff, 1981; Zey-Ferrell, 1979) and previous research on role impact-related topics. The proposed model identifies the conceptual and empirical factors which lead to the role impact.

Chapter IV provides background information about the study and an overview of the procedures that are used. Data collection, the sample, operationalization of key concepts, and statistical procedures used in data analysis are discussed. The Department of Agricultural and Rural Sociology, Institute for Agricultural Research, Ahmadu Bello University Zaria, Nigeria approved the research instrument, with respect to the Use of Human Subjects in Research. The data were collected in October, 1982.

Chapter V has two major sections. First, a descriptive section on the characteristics of respondents is provided. Second, the hypothesized relationships that are outlined in the theoretical model of role impact are empirically tested.

In Chapter VI, the major findings of the study are summarized and implications for theory, research and practice are discussed. It is hoped that this information will be useful to change agents as they seek to find more effective methods for improving the impact of the extension agent, and ultimately, in uplifting agricultural productivity and rural life.

CHAPTER II. BACKGROUND TO THE RESEARCH PROBLEM

In order to understand and appreciate the present research problem, it is important to provide a historical and contemporary background of issues underlying the research problem. This section discusses the nature and extent of the problem.

Agriculture in the Nigerian Economy

Agriculture in Nigeria is considered as the background of the country's economy even during the 'oil boom' era. Its major contributions are several. First, it provides much of the food and raw materials (cotton, leather, rubber, etc.) for the country's consumption. For instance, at independence, in 1960, about 70 percent of Nigeria's gross domestic product (GDP) was attributable to agriculture. However, in 1980, the proportions had been altered by the increasing contributions of manufacturing, the oil industry and other economic sectors. Agriculture now contributes to less than 20 percent of the GNP (Nelson, 1982).

Second, it provides employment for about 70 percent of the labor force in the country. Third, it provides exports for earning foreign exchange for the country's import of industrial equipment and other requirements. For example, in 1960, agricultural commodities accounted for close to 90 percent of export values. In the early 1970s, agriculture contributed to about 33 percent of the total national export (Anthonio, 1972). By 1980, however, agricultural exports accounted for only about 5 percent of total exports (Nelson, 1982).

Fourth, it has been a significant source of capital accumulation. That is, agriculture generates internal capital through export duty, marketing board surplus and saving which has contributed to the financing of investments in other industries and services.

Fifth, it has provided a source of income for the masses of farm families with which to purchase industrial products and other services essential for better living.

Evidently, all of these contributions have been declining in magnitude and quality. For example, in the early 1960s, Nigeria was a net exporter of food crops such as oil palm, groundnuts and cocoa and other agricultural products like cotton and rubber. By the early 1970s, Nigeria was importing food. From 1968 to 1978, Nigeria's food import bill increased from U.S. $38.59 million to U.S. $1,805.10 million (Central Bank of Nigeria, 1971, 1979).

Even with this turnaround, the agricultural sector still represents a large proportion of total national production of Nigeria, producing for example, 80 percent of the food consumed (Anthonio, 1972). However, it is quite apparent that there has been a fast and steady decline in production in recent years. For example, although the Federal Government's projections of food demands, supplies and deficits by 1982 suggested that domestic supply of crops and crop products was growing at about 0.79 percent per annum, estimates by Abalu and Atala (1982) suggested that per capita growth of agricultural output in the country had been declining at an average rate of some 2.5 percent per year since 1970 and it was very likely that the per capita growth of

agriculture in the country would continue its decline. Expert explanations of this decline point to several reasons, the major ones of which are: the rapidly growing population, rural to urban migration, inflation and underevaluation of agriculture in terms of production, research and extension.

The trend in the expenditure for agricultural development looks quite impressive. For example, the capital expenditures on agriculture for the Second National Development Plan Period, 1970-74, was ₦76.828 million (Federal Republic of Nigeria, Second National Development Plan, 1970-74) while the total allocation for agricultural sector in the Fourth Plan period (1981-85) jumped to ₦4.4 billion with the River Basin Development Projects accounting for about 40 percent of the amount (Federal Republic of Nigeria, Fourth National Development Plan, 1981-85).

However, this trend of increasing expenditure for agricultural development could be misleading. For example, Elegalam (1980) found that during the First National Development Plan (1962-68) about 42.8 percent of the capital expenditure allocated for the agricultural sector was not spent and in the Second Development Plan (1970-74), about 65 percent of the estimated expenditure was not spent.

Extension and Agricultural Development in Nigeria

There was a faulty start in Extension in Nigeria. During the colonial period (1880-1960) extension services were primarily oriented toward promoting the production of export crops. Extension contact was

minimal and consisted mostly of issuing improved seeds to export crop growers who later became officially known as progressive farmers. The role of the extension agents as field representatives of colonial government responsible for enforcing rules and regulations regarding agricultural practices such as land conservation, received greater attention than providing agricultural advice and left a legacy of distrust for government extension agents. Also, there was little or no training for extension agents and, therefore, in many instances, peasant rationality was shown to be superior to the extension officers' knowledge so that these officers spent their time finding out and advising on what the peasants knew already (Hart, 1982). There is a general agreement among African research scholars including Eicher and Baker (1982), Hart (1982) and Wallace (1983) that the colonial policies, approaches and attitudes have been directly or indirectly influencing agricultural development programs in the post independence period. The legacy of the colonial extension system is deeply embedded in the structure of the present day extension system.

After independence in 1960, the technique of extension shifted from coercion to persuasion but the tendency to concentrate on export commodities, to formulate extension advice with little regard for farmer circumstances, and to favor progressive farmers has continued to dominate extension in Nigeria. In the early 1960s, there were extension specialists for export crops such as cotton, cocoa, palm oil, and rubber and none for any of the local food crops. In other words, agricultural extension services did not pay attention to the masses of

peasant food producers in the country who then, produced all of the country's basic food staples sufficiently.

Agricultural extension in Nigeria is one of the areas depicting government's policy of neglect for rural areas, agriculture and food production. Because of the government's general neglect of agriculture and food production, extension services in Nigeria have equally received little attention. The result has been that most extension services have been understaffed and the workers have been under-paid, ill-equipped, under-trained and consequently, they have low status and low work motivation relative to workers in other sectors of government ministries. It is not surprising, therefore, to find many instances whereby peasant rationality is superior to the extension officers' knowledge.

Extension is still slow and unglamorous in Nigeria today. Women extension agents are virtually nonexistent despite the equal or more involvement of rural women in agricultural activities, especially food production, storage and preparations as compared with their male counterparts. Similarly, rural youths have been generally overlooked by extension, their significant role in agriculture and rural development notwithstanding. This situation sustains the long standing skepticism surrounding the effectiveness of extension services since the colonial period.

The Organization of Agricultural Extension in Nigeria

Extension was an integral part of the centralized Department of Agriculture in the early part of the colonial period. By 1912, there were two departments of agriculture, one in the southern part and the other in the northern part of the country. The structure of each consisted of the regional, district and native authority levels. In 1921, a unified department of agriculture was created at the national level. Following the creation of two administrative provinces in the country in 1941, the Department of Agriculture was regionalized accordingly, with the headquarters of the southern provinces (including southern Cameroons) at Moor Plantation and of the northern provinces at Samaru-Zaria.

With the introduction of the ministerial structure in 1952, three Extension (Field) Service Divisions were established in the northern, western and eastern parts of the country headed by the Chief Agricultural Officer (CAO), Chief Agricultural Extension Services Officer (CAESO) and the Chief Inspector of Agriculture (CIA), respectively. The organizational structures of extension programs of these regions were basically the same, consisting of Regions, Provinces, Divisions, Districts (or County Councils in the East), Local Councils and Villages.

While the regional ministries of agriculture in the west and east had research institutions and schools of agriculture as integral parts of their structure, that of the north had the Institute for Agricultural Research (IAR) which was and still is responsible for agricultural

research in the area. The Research Liaison Section of the Institute served as a connecting link between the Institute (Research) and the Ministry of Agriculture. At this time, various types of quasi-government agricultural agencies which were meant to take over the service aspects of extension were established. They include credit corporations, marketing boards and direct production agencies.

After political independence in 1960, special commodity extension units were established to promote development and production of export crops meant for foreign exchange earnings. These included the Cocoa Development Unit (CDU), Rubber Production Division, Palm Produce Division, Groundnuts Division and Cotton Division. These units are all considered to have registered success records as evidenced by the well-known groundnuts and cotton pyramids in the North and the massive increase in cocoa and palm produce in the West and East, respectively, in the mid-sixties (Akinbode, 1980).

The general extension (or Field) Service Divisions were, as it is today, left to educate the masses of peasant farmers involved in the production of other types of agricultural produce including food crops.

Presently, there are nineteen states in Nigeria. Each state has a ministry of agriculture which supervises local government departments of agriculture in addition to its own programs. Then, there is a Federal Ministry of Agriculture which carries out its own programs and oversees the state ministries. Each of these ministries of agriculture has a general extension unit and these units are quite similar in their organizational structures. Typically, a ministry of agriculture

comprises the administrative and the technical divisions and is headed by a permanent secretary who is responsible for the administration of the Ministry, advising the government on matters related to agricultural development and programs and implementation of government agricultural development policies. The technical units include cooperatives and extension which are headed by chief technical officers who are responsible to the permanent secretary. For example, the Extension Service Division of the Ministry is headed by the Chief Extension Officer (CEO) or Chief Agricultural Officer (CAO) who is responsible for matters regarding extension work. The CAO is assisted by Principal Agricultural Officers (PAOs) who may make decisions on his behalf and keep him informed of their decisions and activities.

The major part of extension work is at the field level. At this level, a Senior Agricultural Officer (SAO) supervises his province or district, Agricultural Officers (AOs) are in charge of their divisions or districts, Agricultural Superintendents (ASs) supervise Local Councils and Agricultural Assistants (AAs) supervise Field Overseers (FOs) who maintain contact with farmers at the village level. In this hierarchical framework, each officer is responsible to his immediate boss.

Besides the general government extension services and the extension services of the recent Agricultural Development Projects such as the Kaduna State Agricultural Development Project, there are several other types of extension organizations responsible for information and technology transfer. There is a university-based extension system which

has potentials for agricultural development in Nigeria judging from the relative successes of Badeku Project of the University of Ibadan, the Isoya Project of the University of Ife, the Agricultural Extension and Research Liaison Services (AERLS) of Ahmadu Bello University, Zaria and the Okpuje Project of Nsukka University. Far more has been achieved in terms of developing self-confidence in the farmers as well as confidence of the farmers in these agencies which serve them, than has ever been achieved by the civil service extension (Akinbode, 1980). The AERLS needs special mention here. It is an autonomous institute under the Ahmadu Bello University complex whose main function is to serve as a link between research and practice. In this sense, it communicates between the IAR, which is a sister institute also under the university complex, and the Ministries of Agriculture in the northern states of Nigeria. This type of arrangement seems to be working successfully even though there is room for improvement.

Recently, the establishment of eleven River Basin Development Authorities which are responsible mainly for tapping water resources for agricultural production and also for rural and urban development has created another extension management system whose contributions have not yet been assessed.

There are also a few private extension systems such as that of the Nigerian Tobacco Company which is a commercial company and the nonprofit Norwegian Church Agricultural Project (NDRCAP) established by a Norwegian Church Relief Organization at Ikwo in Abakaliki area for the advancement of agricultural and living conditions of the people.

Both of these are relatively small scale extension systems which are operating successfully due to good working relationships existing among the extension workers/organizers and the farmers.

Agricultural Extension in Kaduna State

With the extension of the Funtua Agricultural Development Project to the whole of Kaduna State to become known as Kaduna State Agricultural Development Project, the structure of the state Ministry of Agriculture changed in composition as well as in nomenclatures. The KSADP took over most of the agricultural development functions from the Ministry of Agriculture but remained an autonomous organization under the Ministry. The head of the project is the Project Manager who is responsible to State and Federal Ministries of Agriculture and the World Bank. The basic principle of the project is integrated rural development. Therefore, the basic units of the organization are: Engineering, Commercial, Seed farms, Technical, Training, and Accounts and Administration. Alongside these units are the Land Use Planning and the Evaluation and Monitoring Units.

Extension services come under the technical unit which is headed by the Chief Technical Officer (CTO) who is assisted by the Deputy CTO at the zonal level. At the district level, there are Development Officers (DOs), Commercial Supervisors and Farm Management Advisers. At the Farm Center level, there are Agricultural Assistants (AAs) and Agricultural Instructors (AIs), Assistant Supervisors and Commercial Assistants and Farm Management Assistants.

The Present Situation

All of the extension systems discussed above are operating simultaneously without a central coordinating body and with little or no accountability to the Federal Ministry for Agriculture. There is also very little, if any, horizontal coordination or cooperation among these extension organizations. Perhaps the most important aspect of these organizations is that very little or no empirical evaluation research has been carried out to determine the problems affecting their performances and to find solutions to them. The ADP systems are fast spreading all over the country even though the success of the Funtua prototype has been questionable and its replicability on a wider scale in Kaduna State is yet to be ascertained.

The Focus of the Present Study

In light of the lack of scientific information about the replicability of ADPs in Nigeria, the present study will analyze data collected from one of the zones of replication of the FADP with respect to the roles and the impact of the extension agents and the problems concerning role perception, role performance and the impact of the extension organization. Especially critical is identification of differential significance of the explanatory variables for role performance and the bivariate relationship between role performance and role impact.

CHAPTER III. THEORETICAL FRAMEWORK

Theoretical formulations which were developed for the present analysis are presented in this chapter. First, a rational for the role and impact perspective chosen is presented. Second, role impact is discussed. Third, role theory is outlined with emphasis on relevant concepts and variables. Fourth, organization theory is discussed in terms of its applicability to role performance and impact. Fifth, an exploratory model of role impact is presented. Sixth, literature review of variables in the model is provided. Seventh, and finally, general and specific hypotheses for the study are derived.

Theoretical Orientation

In the present computer age, most farmers in rural Nigeria are still involved with traditional farming methods and low yielding varieties. Yet, it has been illustrated that farmers, like other sets of people, are rational human beings (Bohlen, 1967), therefore, responsive to beneficial change. Williams (1978:7) asserts that Nigerian subsistence farmers "are rational and economic men, who can react to economic stimuli almost as quickly as any highly commercial farmer in the world. Given a favorable setting, they can be responsive to the idea of higher income; they will respond to the introduction of profitable new crops and the adoption of profitable new practices."

Research evidence shows that Nigerian farmers show keen responsiveness to innovations that are perceived as profitable (Clark and Akinbode, 1968; Williams, 1969), when they have access to extension

agents (Kidd, 1968; Basu, 1969), and when the introduced innovations have characteristic relative advantage over existing practices (Obibuaku, 1966; Basu, 1969). Conversely, the farmers have rejected innovations perceived to be unprofitable (Williams, 1969), unaccompanied by extension information (Kidd, 1968), and lacking relative advantages over existing ones (Kidd, 1968; Obibuaku, 1966).

Within this framework, it is reasonable to deemphasize charging the farmers of irrationality, low motivation and traditionalism and direct attention to the role and role impact of extension agents/agency in the country. Otherwise, a strange contradiction is maintained in which extension agents stigmatize peasant farmers as indolent, underemployed and unresponsive to innovations, when their own job activities leave much to be desired. A long standing problem has been how to bring about improvement in agents' job-related behaviors and the conditions that lead to those behaviors. The ultimate goal, of course, is to achieve agricultural and rural development.

Agent role and impact approach can be justified from Rogers' diffusion of innovation perspective to social change and development. Rogers (1983) considers change agents as individuals who influence clients' behavior and serve as a linkage between the change agency and the client system. In their role, change agents (1) develop need for change, (2) diagnose clients' problems, (3) create intent to change the behavior in the client, (4) translate intent into action, and (5) stabilize adoption and prevent discontinuances. However, the success of agents depends on, among other things, the change agent's effort in contacting

clients, compatibility of extension programs with clients' needs, empathy with clients and their credibility (Rogers, 1983).

Brown (1981) has criticized the traditional approach to innovation diffusion which emphasizes the demand aspect of diffusion. In his new market and infrastructure perspective, he lays emphasis on the supply side of diffusion. Thus, the importance of agents/agency role receives as much attention as the traditional interest in the individual client choice or adoption decision. According to Brown (1981:50), "...the mechanisms through which innovations are made available to potential adopters are of equal if not greater importance; that is, it is necessary to consider supply as well as demand factors."

Social systems approach also provides justification for focusing on the role of extension agents or agency. Coughenour's (1968) innovation diffusion framework outlines a system comprising innovative, communicative, and practitioner subsystems. Each subsystem must perform its functional imperative for the general system to survive and function effectively. Thus, in the case of the communicative (extension) subsystem "...a sufficient proportion of its component actors must act in accordance with the requirements of its role systems" (Parsons, 1968:27).

Communication has contributed much to agricultural and rural development. To increase Nigerian farmers' adoption rate for agricultural technologies, an important strategy would be through an effective communication (extension) system. The important role of the communication system in development has been asserted in the social

psychological perspective of social change and development by Lerner (1958), McClelland (1961), and Hagen (1962). No change in society can take place without communication other than in the case of natural disasters. Communication is indispensable to every attempt to bring about change (Hedebro, 1982). The crucial importance of development communication in rural areas necessarily puts the role and impact of extension agents in a critical position for much attention.

From the organization theory perspective, the centrality of communication has been exhibited by many theorists. For example, Katz and Kahn (1966:223-224) have noted that communication has the broadest relevance to any group or organization and is "the very essence of a social system or an organization." Similarly, the statement made by Davis and Scott (1969:255) that "Communication is the bridge over which all technical knowledge and human relationships must travel" does not only underscore the role of communication in general, but implicitly stresses the important role of extension agents/agencies in agricultural and rural development.

Role Impact

Role impact is the ultimate dependent variable in the model in this study. Impact can be defined more broadly than goal attainment as long-term influence on the state of the environment surrounding the organization (Kanter and Brinkerhoff, 1981). According to Mulford et al. (1977), it is important that program evaluation should give appropriate attention to the efficiency with which goals are achieved and the impact that programs have on the organization's viability and credibility.

The last stage of role performance is role impact which, according to Brumback et al. (1978), is synonymous with "end results," "ultimate outcomes," or "ultimate impact." Generally, impact is interchangeably described as outcomes, results, effects (or effectiveness), outputs, and consequences. In most cases, an organization can be viewed as effective (or ineffective) to some degree in terms of its efforts to meet multiple and conflicting environmental constraints, goals, constituents, and time frames (Hall, 1982).

Measurement of impact has been done objectively or subjectively or both. Objective measures of agents' role impact commonly used in adoption-diffusion studies is measure of adoption rates for new technologies.

Subjective measures have also been used in studies of extension impacts by analyzing the perception of clients regarding given services (e.g., Bennett, 1982; Christenson and Warner, 1982; and the USDA Science and Education Administration-Extension, 1980). According to Katz et al. (1975), a perception of impact study is one means of demonstrating the quality of service provided by the organization. Perceptions of impact studies are designed to provide an organization with feedback from appropriate publics on its performance in fulfilling their needs. These studies, therefore, have consequences for goal setting, program planning and development, staffing patterns, and allocation of resources (Mulford et al., 1977).

Bennett (1976) identified a seven-level hierarchy of evidence necessary for a comprehensive evaluation of impact and effectiveness.

These levels are (1) inputs, (2) activities, (3) people involvement, (4) reactions, (5) KASA (knowledge, attitudes, skills, and aspirations), (6) practice change, and (7) end results.

Measures of client satisfaction have been proposed as a means of sharpening the focus on effectiveness. A model of effectiveness based almost entirely upon client satisfaction was used by Katz et al. (1975) in their study of government services. However, the role played by extension services is conditioned and influenced by relevant factors which, to a great extent, determine role success or effectiveness. These influential factors have been differentiated into two categories: (1) endogenous or "within-the-system" ones such as staff quality and promotional opportunities, and (2) exogenous or "external-to-the-system" ones like policy and client situations (Wang, 1983).

According to Ladewig (1983), if efforts to measure the organizational effectiveness of Cooperative Extension Service are to provide meaningful results, such efforts must be based on a multi-dimensional framework. This framework should reflect the major activities of Cooperative Extension Service in carrying out its mission; because of the diffused nature of Extension programs, measures of individual performance in carrying out major activities should be linked to measures of program accomplishment.

Pennings (1973) indicates that there are minimum correlations between objective and subjective measures. In the present study, the subjective appraisal was the approach used for measuring the impact of agents' role

performance. Agents' responses as to how much they perceived selected impacts or changes in the client system were accountable to Extension Service role were assumed to reflect reality.

Role Theory

Role theory has frequently been used as a framework for explaining individual and organizational roles and effectiveness (e.g., Gross et al., 1958; Akinbode, 1971; Schafer et al., 1976; Nye, 1976; Rogers, 1983). Role has been one of the most frequently used sociological concepts (Biddle, 1979). It is extensively used not only in sociology, but in other disciplines as well, notably psychology, anthropology, social work, and education.

Role perspective basically involves two positions: the focal position and the counter position (Gross et al., 1958). The focal position is the particular position being studied, while the counter position is the position to which the role of the focal position relates. In the present study, for example, the field extension agents represent the focal positions, while the top level state extension officials represent the counter positions. Farmers could also represent another set of counter positions in this case.

The basic notion of role theory, however, is that in any organization, every individual occupies a position which assumes certain given roles which are expected to be performed by the incumbent of a given position. The theory is multi-dimensional, comprised of various components like status position, role expectation, role perception, role

consensus, role performance, role conflict, and role consequences or role impact.

According to Biddle (1979), role theory is a science concerned with the study of behaviors that are characteristic of persons within contexts and with various processes that presumably produce, explain, or are affected by those behaviors. One of the key concepts in role theory is social positions or statuses. The most common notion is that roles are associated with social positions and/or statuses. Gross et al. (1958) define a role as a set of expectations applied to an incumbent of a particular position.

Several explanations of roles have been advanced (Biddle, 1979). The most common one is that roles are induced through consensus or the sharing of expectations for role behavior. For example, extension agents have (themselves) learned expectations for the appropriateness of their behavior or extension activities, and others (their supervisors and colleagues, farmers, and the society) have encouraged them to do so. The nature of the context forms another explanation of roles. Most role behaviors are contextually bound. Therefore, the individual behaves in relation to his or her "definition of the situation." The impact or consequences of role behavior provide another type of explanation for roles. Roles have characteristic effects or functions within the organization or the social system, even though some functions of roles are inadvertent, accidental, and decried by all concerned. Finally, the role concept is also explained in terms of the socialization and adjustment of the individual. The infant learns role appropriate behavior through role

playing (practicing the role performed by others) and role taking (internalizing others' expectations of him or her). In adult life, the individual enters some positions (ascribed or prescribed). While in these positions, he undergoes socialization and adjustment regarding the roles he takes on.

Organization Theory

Organization theory is also used extensively as a guide for understanding the roles and effectiveness of organizations and their participants (e.g., Mulford et al., 1977; Kanter and Brinkerhoff, 1981; Rogers, 1983). Formal organizations are defined as goal-oriented collectives, each of which consists of groups and individuals and in turn comprises a social institution. Organizations have relatively identifiable boundaries that are open to the environment. They process technologies, structures, processes, and perform activities with varying degrees of effectiveness and efficiency. The major components of organizations are environment, context, structure, process, and performance. With these dimensions, organization theory becomes another important tool for our understanding of the complex network of interrelations among the various aspects of extension organization. The major theoretical assumptions of organization theory are that (1) people filling roles in an organization function as coordinated parts of a machine, and (2) organizations possess the following elements to some degree: power, authority, task differentiation, and rules and procedures (Zey-Ferrell, 1979).

An important unit of analysis in studies of organizations is the individual. The behavior and attitude of the individual are of great importance to the organization which comprises positions occupied by individuals, especially with regard to such characteristics as commitment, job satisfaction, or professional attitude of the individual. In this regard, both role and organization theories are important complementary frameworks for analysis of the individual (extension agent) and the organizational (extension agency) role performance.

The effectiveness of an organization and its members depends, among other things, on the decision making and planning processes and the personnel policies (management) pursued. Decision making constitutes the major processes involved in carrying out the work of the organization (Szilagyi and Wallace, 1980). Organizations engage in formal decision making processes when establishing corporate goals and choosing strategies to achieve those goals. The single most critical ingredient in decision making is information. A great deal of evidence as well as common sense suggests that the more and better quality information one has, the better will be the quality of the decision. The major avenues by which information is gathered and exchanged among parties are through communication. Hence, participation or the process of communication among individuals, informal groups, and formal units is necessary to decision making (Szilagyi and Wallace, 1980).

Planning program activities is critical in the implementation of any organizational decisions and development techniques. Major dimensions of planning include timing (when), location (where), and depth (range and

coverage of planned activities) (Szilagyi and Wallace, 1980). Effective program planning activities involve setting goals and establishing targets that lead to task accomplishment.

Organizational personnel policies, often referred to as staff management or organizational climate, determine the internal functioning of organizations. Personnel policies are assessed by the way the organization deals with its employees and its general and task environments. Properties of staff policies include (1) structure--organization constraints, rules, regulations, and red tape, (2) progress and development, (3) individual responsibility or independence, and (4) general satisfaction with policies and activities of the organization (Litwin and Stringer, 1966; Schneider and Barlett, 1968). It is apparent that the importance of personnel policies in the performance of organizational members cannot be overstressed.

Model of Role Impact

Role and organization theories offer some important leads for explaining the role and role impact of extension agents. The two theories set out several concepts and variables which are presumably important to role and role impact.

The heuristic model for identifying bivariate and causal relationships in the research starts from agent characteristics (age, education, training, job tenure, rank, job satisfaction, and attitude), organizational factors (decision making, planning, and personnel policies), role perception, role consensus, and role performance to role impact, as illustrated in Figure 1. In this model, agent characteristics

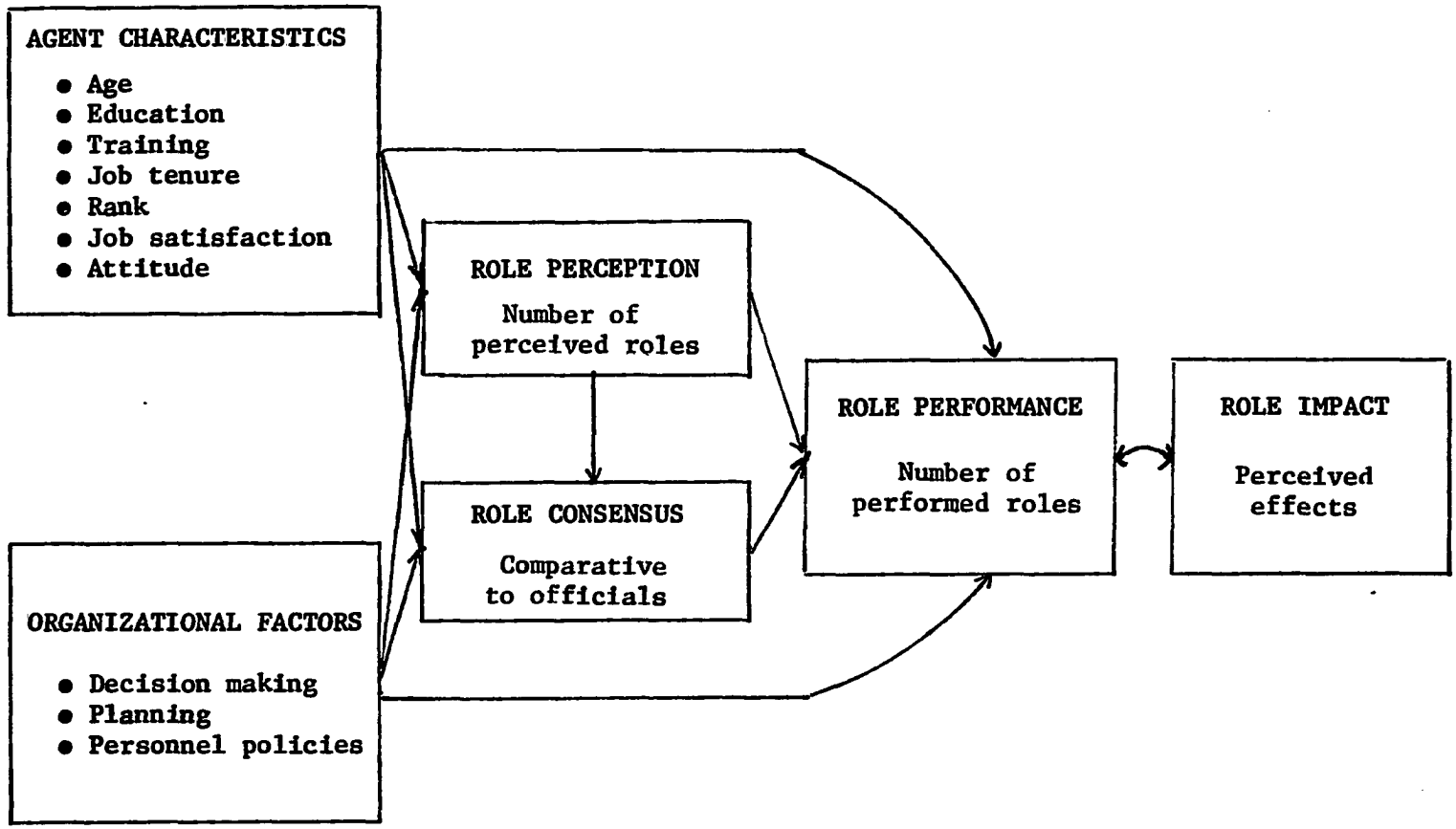


Figure 1. A heuristic model of role impact

are posited to affect role perception, role performance, and role consensus. Organizational factors are posited as affecting role perception, role performance, and role consensus. Role perception is deemed to affect role consensus and role performance. Role consensus should be important for role performance. Finally, role performance is believed to directly affect role impact (Figure 1).

For the purpose of clarification, a heuristic model is a figurative representation of a perceived object used to guide one in pursuit of its knowledge. It provides (1) a notational ensemble, a perspective that permits an ordered perception of the empirical world, and (2) it is a directing scheme for theory construction and further investigation. It is not a theory per se, but serves as a launching pad for theoretical ventures. Thus, it can be neither "true" nor "false," only serviceable and adequate to varying degrees, for its raison d'être is cognitive productivity (Wacquant, 1985).

Literature Review of Variables in the Model

Agent characteristics

The agent characteristics will include age, education, training, job tenure, rank, job satisfaction, and attitudes.

As organizational participants, agents are those individuals who make contributions to the extension organization in return for a variety of inducements (Simon, 1957). The extent and intensiveness of their involvement vary greatly. Participants also vary much in the level of skills or expertise they bring to the organization. Structural arrangements within organizations are designed to accommodate these

differences in skill levels and in accompanying power and demands for autonomy. Kanter and Brinkerhoff (1981) have noted that when task structure is flexible, effectiveness depends more on a person's motivation, discretion, and responsibility than on role.

Age

The age of an individual is indicated in years. In many societies, age is associated with status and roles (Linton, 1942; Parsons, 1961). Age statuses of individuals are frequently associated with their orientations and behavior. Different age cohorts and generations tend to have had unique socialization experiences, which are ultimately reflected in their views and conduct (Salama, 1983).

Age and role performance In an organizational setting, age of participants tends to be associated with status position, which also tends to be associated with a variety of multiple responsibilities and degrees of sense of responsibility. Persons with various responsibilities would tend to perform many such responsibilities. It would be expected that age and its enhancement of one's range of duties and sense of responsibility would be correlated with the number of responsibilities performed. Thus, older employees are more likely to perform more or most of their role expectations or duties than the younger ones.

In Nigeria, extension work seems to be less attractive than other jobs. After completing school, many accept extension positions as temporary employment while they continue searching for opportunities for higher education or other jobs. The system also tends to have little or no room for the "young turks" who are eager to move fast to the top

positions. Opportunities for personal advancement in extension may largely be a function of the individual's social connections and favoritism rather than purely hard work. This situation tends to translate into lack of interest or job commitment and low job performance on the part of new and younger workers. On the contrary, older agents tend to have many years on the job, shoulder much responsibility, are committed to their job, and perform many job roles. It needs also to be pointed out that in the present study, role performance was limited to the scope of role activities performed without identifying either the quality or effectiveness of performance or the congruency between the specific roles performed and other variables.

Age has been found to affect individual extension worker performance on the job (Ekpere, 1973; Saigaonkar and Patel, 1970). Quinn and Shepard (1974) found age to be positively related to job satisfaction, which is expected to positively influence job performance. It is hypothesized here that ages of the extension agents are positively related to the number of role activities they perform.

Age and role consensus Differential experience, educational backgrounds, and psychological characteristics affect the way individuals see certain things in a situation (Rice and Bishoprick, 1971) or their role expectations. It is reasonable, therefore, to expect that differences in personal characteristics of agents, including age, would be associated with their role perceptions as well as their role consensus. Since the top extension officials tend to be older than most of the extension agents, it would be assumed that agents who are similar in

certain background factors, such as age, with those of the top officials would tend to correspond more positively with official role definitions and/or agree on extension roles. Similar age would tend to homogenize perceptions and generate consensus among individuals of the same age group, cohort, or generation. This process of homogenization of perceptions or consensus would tend to be achieved increasingly with advancement in ages of cohort members. This is more so, the longer the individuals stay in an organization and become increasingly involved in its administration. Accordingly, it is hypothesized that the ages of extension agents are positively related with their role consensus. Low relationship may signal a dynamic or changing organization and/or conflict.

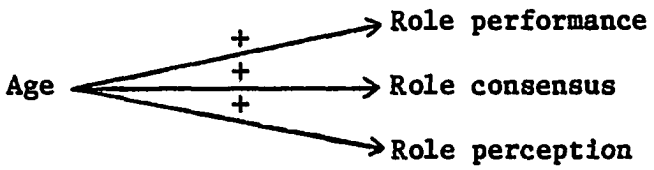
Age and role perception In addition to the characteristics of perception object and situation, perception is influenced by the characteristics of the perceiving person. One person sees certain things in a situation and another person sees different things in the same situation (Rice and Bishoprick, 1971). The fact of the matter is that an individual interprets his or her environment into meaningful patterns. The patterns are different for each individual and are a result of the individual's experience, educational background, and psychological characteristics. As a result of the interaction between the individual and his/her environment, perceptual and behavioral consistencies develop based on their evaluation or understanding of their environment.

Aldrich and Pfeffer (1976) identified the factors that combine to induce a common perception of environment and the roles of organizational

members as including sameness in training background and experience. Every age group tends to have specifically different socialization experiences, which uniquely shape their perceptions. Also, one tends to acquire more experience and a broader view of things or issues as one gets older.

In Extension, age is likely to be associated with better understanding of conditions of the client group and the various activities needed to help the group. Thus, by virtue of their greater experience with the clients' problems, older agents should perceive more responsibilities for extension agents than the younger agents. It is hypothesized in this study that ages of extension agents are positively related to their perception of extension roles.

The specific relationships anticipated between agents' ages and their role performance, role consensus, and role perception are summarized schematically below:



Education

Education refers to formal knowledge acquisition or schooling. The level of educational attainment is frequently represented by the number of years of formal education. Educational attainment is an individual characteristic which is associated with the individual orientation, knowledge, and skills presumably appropriate for many job responsibilities in organizations.

The individuals' level of educational attainment is an indicator of their exposure to formal training processes through which knowledge and skills are acquired and problem-solving competence developed (Salama, 1983). Increased education enhances individuals' abilities to effectively process the diverse information that they receive and to deal with abstract ideas. Thus, formal education should enhance change in agents' ability to adequately understand the client problems and needs and be able to perceive and perform the activities that are required for solving the problems and satisfying the needs. In the Nigerian extension system, it is, therefore, lamentable that the village level extension agent who provides the closest contact with producers and does the bulk of the "convincing" is the least educated and the least trained in the system. In fact, the only qualification he has is a primary school education and nine months of agricultural training (Mijindadi, 1974).

Education and role performance A basic assumption in this study is that formal schooling encourages and facilitates a desire to understand development problems and the ability to devise workable solutions. Education is a central tool for the development of skills and practical ability. Education changes people in terms of what they can do (skills) and what they actually do (Leagans, 1963).

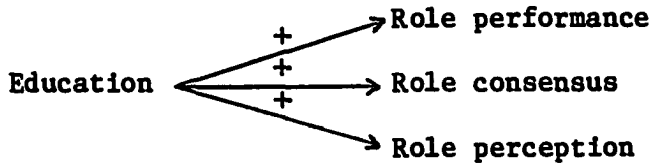
Among other factors, education has been found to affect the individual extension worker's performance on the job (Ekpere, 1973). Saigaonkar and Patel (1970), however, found no significant difference between "more successful" and "less successful" extension workers when compared in respect of their level of school education. Yet, the

extension worker must have a wide knowledge of rural environment so as to be able to find out the needs and psychological make-up of the community (Al-Haj and Hassanallah, 1969). Education has been found to influence individual agent performance in extension organizations (Williams, 1967; Jibowo and Williams, 1976; Alao, 1977; Obi, 1965; Obibuaku, 1975). In line with the research literature, it is hypothesized in this study that agents' educational attainment is positively related to their performance of extension roles.

Education and role consensus Different educational backgrounds affect the way individuals see things (Rice and Bishoprick, 1971). Persons trained in different schools or disciplines might have different perceptions and consensus about issues. However, similarity in educational background should correspond with similarity in perception as well as with consensus or agreement on certain views and issues. Since the top level extension officers tend to have the highest educational attainment levels, it is reasonable to expect that high educational attainment levels of the agents would correspond with official role perceptions and role consensus. "The educational scale is premised upon the assumption that men and women who possess similar educations will tend to have similar tastes and similar attitudes, and they will also tend to exhibit similar patterns" (Miller, 1977:238). Thus, it is hypothesized in the present study that agents' educational attainment is positively related to their role consensus or their degree of agreement on extension roles.

Education and role perception Although different schools or disciplines might induce different perceptions, formal education generally provides diverse information, a great deal of knowledge, and a range of problem solving capabilities. That is, education provides many different views or perceptions of problems and problem-solutions. Change in the level of knowledge is a prerequisite for change in individuals' perceptions. Education, viewed broadly, is the most potent force for molding individuals into desirable forms. Education changes people in terms of what they know, think, and feel (Leagans, 1963). Mental horizons of individuals are expanded through education. In this study, it is hypothesized that agents' levels of formal education are positively related to their perceptions of extension roles.

The anticipated relationships between agents' educational attainment and their role performance, role consensus, and role perception are presented below.



Training

Training is a program in which participants learn new knowledge and skills. People bring to their jobs their individual assortments of previously learned skills, knowledge, interests, motivation, and attitudes. The additional learning people acquire after they become employees can take place either through on-the-job experience or through training. Although actual day-to-day work experience is probably the most

effective method for developing expertise in most jobs, well-planned and executed training programs provide the most practical method for people to develop such expertise (McCormick and Ilgen, 1985).

Training is essentially the management of learning for specific goals. Thus, it is applied learning whereby the problem situations selected reflect real problems with real solutions for specific job situations. Organizational job training reflects the goals of the organization, its resources, and the organizational environment and is designed to meet organizational needs as well as the needs of participants and client groups.

Training has been identified as a major factor in agricultural extension. The inadequate or lack of training is frequently suggested as one of the major reasons for the ineffectiveness of extension agents (Fay, 1962; Joy, 1967; Kincaid Jr., 1968; Kidd, 1968; Abalu et al., 1979; Leonard, 1972). Such training should deal with subject matter, methodology, and extension operations (Kidd, 1968), philosophy (Fay, 1962), and new farm technologies (Abalu et al., 1979).

Training and role performance The purpose of training programs is for the trainees to acquire new skills in order to be able to perform their roles more effectively. It would be expected, then, that more training would lead to better role performance.

Lack of meaningful induction and in-service training dealing with substantive area, methodology, and extension operations was identified as one of the factors responsible for the poor role performances of the Nigerian extension agents (Kidd, 1968). Inadequate extension training

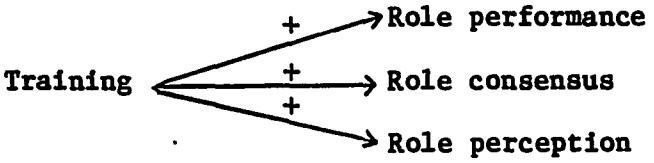
relative to other occupations is one of the things responsible for the unqualified and unmotivated extension organization (Joy, 1967). A successful extension worker must be trained (Fay, 1962; Abalu et al., 1979). In their study, Onazi and Johnson (n.d.) concluded that extension workers in the northern states of Nigeria required training in the seven areas of study considered. These areas in priority order are: (1) technical knowledge in agriculture, (2) agricultural extension philosophy, organization, and administration, (3) communications in Extension, (4) program planning, (5) research and evaluation, (6) educational process and human development, and (7) sociological factors. It is hypothesized here that the number of in-service training programs received by extension agents is positively related to their performance of extension roles.

Training and role consensus Since training programs provide participants with knowledge and skills relevant to their role performance, it would be expected that more training would give participants more knowledge and skills. While different schools might provide different orientations, persons of similar training background or levels with that of top level officials should be somewhat similar with the officials in their acquired knowledge as well as their perception of their roles. Thus, such persons would tend to be in agreement with official definitions of what their roles are or ought to be. In this study, it is hypothesized that training received by agents is positively related with their consensus (agreement) on their roles with officials.

Training and role perception Training programs teach new knowledge and skills for specific organizational goals. Training, thus,

enhances perceptions of the job responsibilities of the participants. Even though different training programs might differ in content and orientation, training generally exposes participants to broader knowledge and understanding of the issues involved in carrying out their duties. It is hypothesized in this study that agents' participation in training programs is positively related to their perception of the roles of extension.

The anticipated relationships between training and agents' role performance, role consensus, and role perception are presented below:



Job tenure

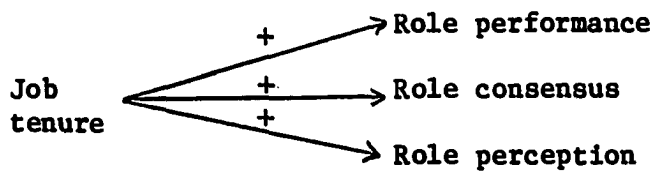
Job tenure is the number of years an individual has worked at his or her current job. Job tenure corresponds with job experience and position or status in organization hierarchy. These, in turn, are related to individual roles in an organization.

Job tenure and role performance Experience and skill go with length of practice or job tenure. Persons who have been on the job longer would have acquired more experience and skills to perform various organizational responsibilities than the new employees. The opportunity to perform various duties in different capacities comes with time. Also, assignment of job responsibilities takes experience and ability into account. In this study, it is hypothesized that agents' years of service are positively related to their role performance.

Job tenure and role consensus Individuals with many years on their jobs would have much knowledge of the goals and functions of their organizations. Old timers in an organization would tend to have reached a silent agreement or compromise on what their organizational goals and functions ought to be and with official definitions of their roles. It is hypothesized here that agents' years of work in extension organization are positively related to their role consensus.

Job tenure and role perception Individuals with long stay in an organization would have acquired much knowledge and experience in the roles and operations of the organization. The individual would have learned, observed, and performed a variety of roles in the organization. Thus, persons who are long in a job would tend to have a wider view of the organizational role expectations. It is hypothesized in this study that agents' job tenure years are positively related to their perceptions of extension roles.

The anticipated relationships between job tenure and role performance, role consensus, and role perception are presented below:



Rank

Rank is the individual's position or status in an organization. Generally, organizational participants are hierarchically ranked. In formal organizations, participants are ranked as lower-ranking, middle-ranking, and higher-ranking persons. Hierarchical ranking in a

work organization implies differential authority and influence for different positions. In addition, hierarchically ranked positions accrue differential rewards and responsibilities (Zey-Ferrell, 1979).

Furthermore, hierarchical ranking is associated with knowledge and competence acquired through the formal avenues of training and education or through the informal avenue of experience. This knowledge enables the professional to guide and direct the client of the service organization or perform highly complex processes within an organization (Zey-Ferrell, 1979).

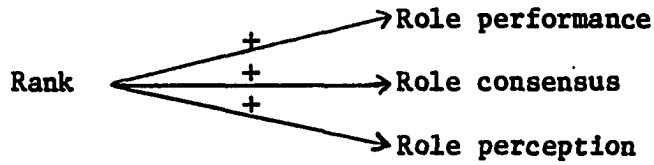
Rank and role performance Given the quantity rather than quality assessment of role impact in this study, it ought to be mentioned that although the number of roles performed may not differ much by rank, persons in higher ranks may have different roles than persons lower in rank. However, according to human capital theory, variation in productivity is a direct result of different levels of investment in human capital factors, i.e., education, training, and work experience (Becker, 1964). Higher-ranking participants in organizations have higher educational attainment levels, more training, and more experience than the lower-ranking employees. These characteristics of workers provide broad perspectives on issues and enhance skills and job performance. Rank has been found to influence agents' job performance (Kincaid et al., 1968; Uwakah, 1981). It is hypothesized here that agents' ranks are related positively with their performance of their roles.

Rank and role consensus Categories of organizational participants such as lower-ranking, middle-ranking, and higher-ranking employees tend

to have common characteristics or backgrounds and orientations. Persons at the higher-ranking category tend to have reached a tacit understanding or agreement as to the roles of the organization's members. Participants tend to come to consensus or agreement with official role definitions through the years and experience. It is hypothesized in this study that agents' ranks are related positively with their role consensus.

Rank and role perception Rank statuses of individuals in organizations are often associated with their knowledge and orientations. The high-ranking participants tend to have a great deal of knowledge about the expected roles of their organizations. They also tend to be similar in their orientations regarding the functions and operations of their organizations and the employees. By virtue of their knowledge of the complexity of the problems and solutions which their organizations contend with, high-ranking employees are likely to have a relatively comprehensive or broad perception of the roles of the employees. In this study, it is hypothesized that the ranks of agents are related positively to the range of their role perceptions.

The anticipated relationships between rank and role performance, role consensus, and role perception are presented below:



Job satisfaction

Job satisfaction is the satisfaction that individuals obtain from the various roles they play in an organization; specifically, satisfaction

with (1) doing the actual content of work, (2) being in the work group, (3) working in the organization, (4) pay and job status (Miller, 1977). It is the feeling of workers about how interesting the work is, how routine, how well they are going, and, in general, how much they enjoy doing whatever it is they do.

There are many theoretical definitions of job satisfaction. The following two definitions seem representative (Mulford et al., 1977): (1) Smith et al. (1969) defined job satisfaction as the feeling a worker has about his or her job; (2) Campbell et al. (1970) consider satisfaction to be the degree to which individuals perceive that they are equitably rewarded by various aspects of their job situation and the organization to which they belong. Job satisfaction has many dimensions including the nature of the work, the supervisor, the organization or agency, pay, promotional opportunities (McCormick and Ilgen, 1985), self, and others (Locke, 1976).

Job satisfaction has been considered as a dependent variable in extension studies. Kincaid et al. (1968) found that senior level staff were more satisfied with their jobs than junior level staff and that extension agents in the northern and western parts of Nigeria were more satisfied with their terms of employment than those in the midwestern and eastern parts. In Uwakah's (1981) study, factors that contributed to the lack of job satisfaction among extension agents as identified by the agents themselves are slow promotion on the job, lack of adequate transportation, lack of essential office equipment and field demonstration tools, and inadequate supply of inputs for the farmers. Although job

satisfaction is frequently used as a dependent variable, it can also serve as an independent variable because of the relationship it has with other variables (Szilagyi and Wallace, 1980).

Job satisfaction and role performance Ordinarily, persons who are satisfied with their work would have been performing quite well to get the things that bring them the feeling of satisfaction. Satisfaction of individuals with their jobs would tend to serve as incentive for better performance. Job dissatisfaction has been frequently associated with absenteeism and deterioration in workers' job performance. Extreme cases of job dissatisfaction have resulted in all kinds of workers-management conflicts.

McCormick and Ilgen (1985), however, make an assertion that although it is intuitively appealing to conclude that satisfied employees are better performers, the data simply do not support such a position. Major reviews (e.g., Vroom, 1964) refute the assertion that satisfied employees are better performers. "Clearly, it is no longer acceptable to hold such a position" (McCormick and Ilgen, 1985).

The exact relationship between job satisfaction and performance has been the subject of much research and controversy over the years (Green, 1972). Some managers and scholars believe that satisfaction causes performance; in other words, a happy worker is a productive worker. Others feel that performance causes satisfaction--a high performing worker will derive satisfaction from doing well on his or her job. Still, others believe that satisfaction and performance cause each other--a satisfied worker is more productive, and a more productive worker becomes more

satisfied. The case may be that a different relationship may exist in each individual. The overriding fact, however, is that performance and job satisfaction are strongly interwoven (Szilagyi and Wallace, 1980).

Although little empirical research exists which supports the notion that individual job satisfaction and individual productivity are directly related (Mulford et al., 1977), some researchers have found some correlations between job satisfaction and role performance, including Mulford et al., 1972; Warren et al., 1976; Yetley, 1974; Smith and Ari, 1964; Dolch and Hefferman, 1973; Friendlander and Pickle, 1968; and Warner, 1972.

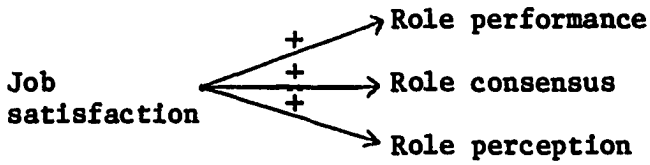
In Nigeria, Kincaid et al. (1968) and Kidd (1968) found job satisfaction or satisfying experiences among extension agents to be enhancing their job performance. In this study, it is hypothesized that the extent of job satisfaction of agents is positively related to their role performance.

Job satisfaction and role consensus Satisfied workers have little or no qualms with aspects of their organizations and their assigned roles. The more satisfied workers are, the more interest they are likely to take in the success of their organizations and the more they would tend to agree with absorbing many officially expected roles which would further lead to greater success by their organizations. In this study, it is hypothesized that the extent of agents' satisfaction is related positively with their role consensus.

Job satisfaction and role perception Job satisfaction should create interest, encouragement, and/or enthusiasm about one's job roles.

These, in turn, should generate better perception and understanding of the variety of his or her expected roles and those of other organization members. It is hypothesized that agents' job satisfactions are related positively with their perceived extension roles.

The anticipated relationships between job satisfaction and role performance, role consensus, and role perception are presented below:



Attitude

An attitude is defined as the affective orientation toward a particular attitude object (McCormick and Ilgen, 1985; Fishbein and Ajzen, 1975).

Descriptive studies of opinion, attitudes, and job commitment of extension workers have been carried out in Nigeria. Kidd (1968) found that 86 percent of the extension workers in the western part of Nigeria had a favorable attitude toward their career in agriculture. Akinbode and Onazi (1979) found that extension workers in the northern states of Nigeria seem to be more committed to their job than their counterparts in the southwest. Uwakah (1979, 1981) also found that in Imo and Anambra States of Nigeria, extension staff had a moderately favorable attitude toward their vocation and toward the farmers, although there was a very high level of dissatisfaction with the conditions of service among them.

Attitude and role performance Change agents' attitudes affect how they teach (Idzorda, 1967) and/or how they perform their duties (Brumback

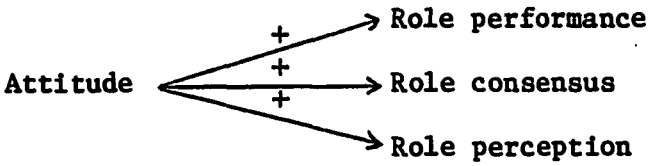
et al., 1978). Agents with favorable attitudes toward their audience would be much concerned with the problems facing the audience and how they could solve the problems. They would, therefore, want to help their clients in many ways. On the other hand, agents who do not have favorable attitudes toward their clients would tend to perform only minimally and, perhaps, in a detached, nonserious manner.

Kidd (1968) concluded in his study of extension in Nigeria, that extension agents' favorable attitude toward a career in agriculture would enhance their performance. Uwakah (1981) found that poor attitudes among extension agents in Imo and Anambra States of Nigeria adversely affected their work performance. Positive attitude was also one of the various characteristics of extension agents that Brumback et al. (1978) identified as having been reliably and validly linked to the critical job duties or distinguishing features of superior job performance by extension agents. In general, attitudes reflect intended behavior if the behavior is feasible. It is hypothesized in this study that agents' positive attitudes toward farmers and rural areas are related positively to their role performance.

Attitude and role consensus All the officially determined and expected roles for extension agents are supposed to be in the interest of the clientele. Agents with favorable attitudes toward the clientele and with the interest of the clients at heart would tend to ascribe to many of these roles. In this study, it is hypothesized that agents' attitudes are positively related to their role consensus.

Attitude and role perception Attitude toward a client group would be related to the amount of interest, knowledge, and concern about the group. A favorable attitude would tend to facilitate understanding of the clients' problems and perception of many expected roles that are important together as solutions to the complex problem of the clientele. Thus, favorable attitudes generate favorable perceptions. Extension agents with positive attitudes toward farmers would tend to understand much of their problems and perceive many needed role activities for extension agents. In the present study, it is hypothesized that agents' attitudes are related positively with their role perception.

The anticipated relationships between attitude and role performance, role consensus, and role perception are presented below:



Organizational factors

Organizations are formally established for the explicit purpose of achieving certain predetermined goals. The goals for which an organization is established determine to a large extent the structure and function of the organization. Essentially, an organization has predetermined goals, prescribed roles, authority structure, rules and regulations, and informal patterns (Rogers, 1983).

Members of an organization are governed largely by its goals and functions and its rules and regulations. They have much tendency to see things and perform in accordance with the organizational goals and

orientation. Therefore, organizational behavior and climate or administration tend to determine the perception, activities, and the ultimate impact of its members. As such, certain organizational factors would tend to influence the role perception, role performance, and role impact of extension agents. In this study, three organizational factors considered in this respect are decision making, planning, and personnel policies or management. These factors are determined from the perceptions of extension agents themselves.

Decision making

Decision making is the organizational process leading to the establishment of policies, goals, rules and regulations, and procedures. Decisions taken by key members of an organization have widespread effect on the organizational members as well as the clientele. It is, therefore, desirable for relevant individuals and groups to be involved in the decision making process on issues that affect them.

De Vries (1977) found in Tanzania that while considerable lip-service was given to educating farmers and involving them in decision making, most decisions were made in the Ministry's headquarters where finances are controlled. Centrally decided policies often took a dominant role in decision making rather than local needs and technical considerations. Most decisions were made for the local extension worker and he or she was merely implementing them.

For Nigeria, Kincaid Jr. (1968) suggested the creation of greater opportunities for making program decisions at the lowest possible level and in as close contact with extension's clientele as practicable.

Without the participation of the client farmers in extension decision making, the extension agents become active "actors" in the presence of "spectators" (farmers) in whom they deposit what they extend and the educational component of extension is lost (Freire, 1974). In general, the inadequate or complete lack of involvement of relevant groups and individuals in extension decision making has raised concern among those interested in extension and development (e.g., Kincaid Jr., 1968; De Vries, 1977; Freire, 1974).

Decision making and role performance The fundamental activity influencing performance is making decisions. The major process by which performance occurs is through decision making. That is, performance results because a decision or choice has been made (Szilagyi and Wallace, 1980). Practitioners' participation in decision making, involving both organizational and nonmembers or interest groups, would tend to improve their knowledge and skills or strategies which are essential for their effective execution of their roles. This becomes more so with increased degree of involvement by participating members.

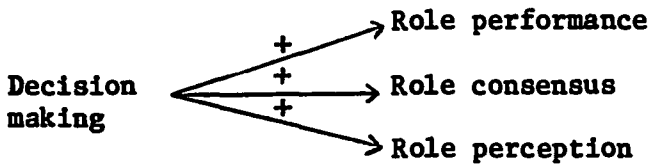
The fundamental philosophy of the extension service is that active participation by the people in program development is essential for the effective planning of education programs (Boyle, 1965). There is much agreement in all studies that maximum involvement of potential and actual constituents in program building produces the best results (Porter, 1961). Participation at all points would help increase the morale and effective output of junior workers (Iwueke and Findlay, 1980). In his study, Kidd (1968) also came to the understanding that participation in extension

decision making by subordinate extension agents and farmers would enhance staff performance. In this study, it is hypothesized that participation in decision making is positively related to agents' role performance.

Decision making and role consensus Decision making process in an organization contributes to the understanding of organization's policies, strategies, and functional roles by its members. Where there is maximum participation in the decision making process in an organization, most members would be knowledgeable of the various expected roles of the organization. Participation in decision making would tend to lead to consensus with official definitions of what roles the organization should perform. This would be more so in cases where democratic procedures are followed. Maximum involvement in decision making produces the best result (Porter, 1961) including consensus on the role expectations of an organization by its members. In this study, it is hypothesized that decision making is related positively to agents' role consensus.

Decision making and role perception Agents' participation in decision making processes of their extension organizations is bound to increase their identification and understanding of their role expectations. This is more so if decision making includes the involvement of clients who would express their problems and concerns for consideration by the agents/agency. It is hypothesized in the present study that agents' perception of decision making is positively related to their role perception.

The anticipated relationships between decision making and role performance, role consensus, and role perception are presented below:



Planning

Program planning is a schematic design and systematic implementation of policy decisions in terms of programs and activities. One of the organization's behaviors or processes is planning (Buford, n.d.). Planning activities involve setting goals or targets that can lead to task accomplishment. The task of implementing a program can be effectively accomplished through the use of plans because the complexities can be controlled and much of the future interactions can be programmed (Szilagyi and Wallace, 1980).

Inadequacies in planning extension programs have been found to be a serious problem in extension (Joy, 1967; Kincaid Jr., 1968; Kidd, 1968; Laue, 1976; De Vries, 1977; Akinbode, 1982). Agriculture is intolerant of administrative inefficiency. Relatively minor delays can have the effect not simply of reducing output but of rendering programs wholly abortive. The need for a flow chart approach to the timing and phasing of activities cannot be overemphasized (Joy, 1967). To be successful, programs and activities have to be carried out at the appropriate times (Akinbode, 1982). In essence, effective program planning involves following the plan for utilization of resources when implementing a program in the field. Plans of work should include the organization of resources into complete packages, and descriptions of how, when, and where the distribution of these resources are to occur.

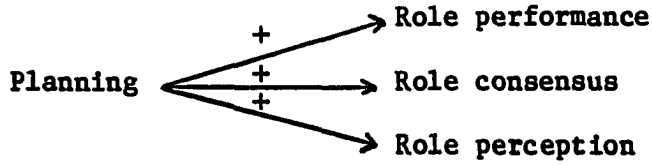
Planning and role performance The essence of planning is to be able to carry out programs efficiently and effectively. Unplanned execution of programs often results in waste and failure. Activities to be performed may not be all completed within the expected period of time. Planning influences individual performance (Boyle, 1965).

One of the major problems of extension in Nigeria is ineffective planning in the organization. Kincaid Jr. (1968) found the existence and proliferation of many activities (programs, schemes, projects, etc.) under the general name of extension. This created a situation wherein the limited human and material resources have been widely dispersed, fragmented, and inadequate, thereby compounding the problems of coordination, staff strength, training, financial and logistical support, and, ultimately, performance. At the individual extension agent level, these general problems are bound to affect his or her role performance in the negative direction. Lack of effective planning creates multifarious job allocations and descriptions which necessitate inelastic and repetitive file clearing procedures which, in turn, lead to poor conduct and job performance (Olayide et al., 1971). Kidd (1968) found that the management of extension programs in Nigeria required effective plans of work to insure timely delivery and application of necessary inputs. Perception of the nature of planning in an organization by its members would be considered as an indication of reality. In the present study, it is hypothesized that perception of planning is positively related to agents' performance.

Planning and role consensus Program planning entails specification of role activities to be executed and their time and space frameworks. The plan-specified activities to be performed imply role expectations of organizational members and induces or forces compliance on what activities are to be performed. Thus, planning procedures and plans of work would tend to enhance understanding and agreement on organizational roles. It is hypothesized in the present study that planning is related positively to agents' role consensus.

Planning and role perception The process of planning and implementing programs involves identifying and understanding clients, the goals of the organization, the prescribed and expected roles of the organization members, and clients' problems. Thus, effective planning by organization members enhances their understanding of the various designated and expected roles of the organization participants. Perception of the nature of planning in an organization by its members would be a proxy of the actual nature of the planning process of the organization. It is hypothesized here that planning is related positively to agents' role perception.

The anticipated relationships between planning and role performance, role consensus, and role perception are presented below:



Personnel policies

Personnel policies (or management) refer to how organizations address the conditions of the members in terms of pay, benefits, facilities, promotional opportunities, and so on. Many observers of agricultural extension in Nigeria have found different personnel policies wanting. These include policies in the areas of conditions of service (Kidd, 1968), financial and logistical support (Kincaid Jr., 1968; Kidd, 1968; Joy, 1967; Olayide et al., 1971; Onazi and Johnson, n.d.), supervision (Kidd, 1968), and extension-agent/farm family ratio (Abalu et al., 1979).

Personnel policies and role performance It is expected that favorable personnel policies bring workers' job satisfaction which, in turn, enhances their job performances. On the other hand, unfavorable personnel policies give rise to workers' dissatisfaction. Performance may be affected negatively by excessively close supervision (Kanter and Brinkerhoff, 1981). Supervision of highly visible tasks can lower morale and raise resentment (Kanter, 1977). However, in order to keep adequate control of activities, close supervision of subordinates is required for agricultural development (Whyte, 1969).

In their separate studies, Kidd (1968) and Williams and Williams (1971) found a number of agricultural factors impeding staff performance in extension work including poor conditions of work, poor organization and administration, staff shortages, poor supervision, and lack of clear definition of objectives. Onazi and Johnson (n.d.) found that poor transportation facilities were identified by the extension staff in the northern states of Nigeria as the factor which had most hindered the

success of extension agents in their work. Abalu et al. (1979) identified insufficiency of extension agents to be one of the major factors hampering agents' performance.

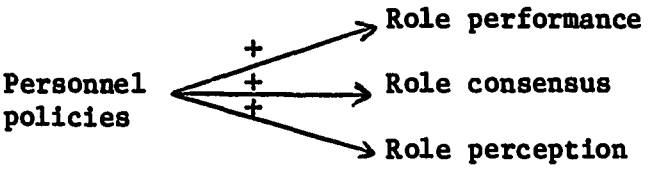
Individuals' perceptions of personnel policies in their organizations are bound to affect the kind of activities they perform as their roles and the manner in which they perform the roles. It is hypothesized in the present study that perception of personnel policies in extension are positively related to agents' role performance.

Personnel policies and role consensus Personnel policies affect the quality and the morale of organization members. They would also affect members' perceptions of their organization's goals and functions. Favorable personnel policies would tend to enhance better understanding of organization roles and positive attitudes and predisposition toward performance of the various role activities by organization members. Organizational personnel policies that are favorable to the members would tend to enhance job satisfaction which, in turn, would be enhancing to role consensus among members with official job descriptions. It is hypothesized here that personnel policies are related positively to agents' role consensus.

Personnel policies and role perception The policies, rules and regulations, and procedures governing the operation and welfare of organization participants affect their perceptions of the nature, scope, or levels of their responsibilities. Favorable personnel policies would enhance favorable consideration and ascription to a variety of job roles.

In this study, it is hypothesized that personnel policies are related positively to agents' role perception.

The anticipated relationships between personnel policies and role performance, role consensus, and role perception are presented below:



Role perception

Role perception can be defined in three different ways: (1) as a set of expectations of a counter position for a focal position, (2) as a set of expectations perceived others are holding toward a focal position, and (3) as a set of expectations a person in a focal position holds for his or her own behavior.

Given the generally vague, broad, and diffused definitions of the role of extension agents, emphasis was placed on the expectations agents hold for their own behavior in this study. However, it is presumed that the expectations agents hold for their own behavior is a synthesis of the expectations of counter positions, expectations agents perceive of others, and expectations agents hold for themselves.

Role perception could, therefore, be considered as the individual understanding of the role of a given position. Therefore, different individuals can have different perceptions of the behavior associated with a given role. For example, Onazi and Johnson (n.d.) investigated the opinion of extension staff in the northern part of Nigeria as to what their duties were and found out that 21 responsibilities were mentioned.

Kincaid Jr. (1968) found that there is a multiplicity of extension role activities in Nigeria including supply of inputs, production programs, educational programs, implementation of settlement schemes, tractor-hiring and servicing, home economics, activities of the young farmers' clubs, and data collection. Also, in his study of Divisional Extension Officers in the western part of Nigeria, Akinbode (1971) presented a list of 30 role activities which he had identified from the records of the Ministry of Agriculture and Natural Resources, previous research, and his own observation of the extension agents at work. The respondents were asked to identify those activities they perceived as their responsibilities and to rank order the roles by their importance. They perceived and rank ordered the roles differently.

Role perception and role performance Role perception influences role performance. Individuals' perceptions of their roles are bound to affect the kinds of activities they perform as their roles and the manner in which they perform these activities. In a complex situation of agricultural and rural development, change agents perceive a variety of different combinations of roles or activities which they believe should be performed in order to achieve desirable levels of change and development among the clients.

It is important to point out, however, that agents' role perceptions may not necessarily translate into performance of the perceived roles because of intervening factors such as insufficient resources or inadequate incentives to accomplish what needs to be done. Also, where quantity or scope measures are used for role perception and role

performance to determine the relationship between the two factors, congruency between items constituting each of these factors would not be known because the performed role activities by an individual might differ from the perceived role activities by the particular individual.

In an organizational setting, according to Gibson et al. (1982), role perception can have a definite impact on performance. Wilkening (1957) states that there are different expectations and perceptions of the role of change agent, and these influence strongly the activities of the agent. Child (1972) also stresses the role of perception in determining actions. According to Biddle (1979), role investigators have often taken the "role perception" as an adequate way to study role behavior, despite repeated evidence suggesting that these two realms are only partially related. He suggested, therefore, that we need to discover what behaviors are in fact characteristic of people in contexts and then ask how these behaviors are perceived and how the perceptions in turn affect the behaviors of those concerned. However, according to Warner and Christenson (1983), perceptions, attitudes, and experiences of program participants provide an important assessment of extension performance. In their study of the social psychology of family food behavior, Schafer et al. (1976) suggested that general values, knowledge, and attitudes influence actual behaviors in the purchase and consumption of food.

Laue (1976) observed that extension workers view themselves primarily as educators. As such, they frequently interpret their role as involving practical activities in which neutral information, knowledge, and skills are impacted to clients or constituents who thus will be better equipped

to make "rational" choices about the practical problems or issues they face.

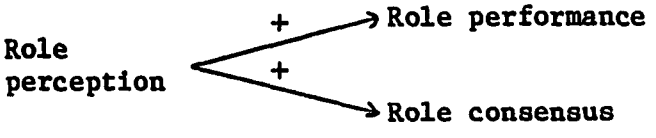
In Nigeria, Kidd (1968) found that one of the factors affecting the role performance of extension agents is that many of the agents perceive their job as that of supervising others by "directives" rather than doing or participating in the job activities. Akinbode (1971) found that Divisional Extension Officers in the western part of Nigeria did not perceive their roles radically different from what they performed. Akinbode, therefore, asserted that the extent to which a role occupant fulfills his or her roles depends largely upon what he perceives his or her roles to be. The study shows that there was a high congruence (agreement) between the two role dimensions--role perception and role performance--among the extension officers even though there was no perfect agreement. These observations and studies point in the direction of a positive relationship between role perception and role performance. In this study, it is hypothesized that agents' role perceptions are related positively to their role performance.

Role perception and role consensus Similarity in role perception implies consensus or agreement in role definition. There is a multiplicity of extension roles. Different extension agents have mentioned many but varied activities as being their responsibilities (Wilkening, 1957; Kincaid Jr., 1968; Akinbode, 1971; Onazi and Johnson, n.d.). Gross et al. (1958) has also noted that there are differential degrees of consensus on role definition and performance which have received only slight attention in spite of the theoretical and practical

implications--variant role definitions may be one of the factors accounting for the variability of behavior or performance of role incumbents.

These imply existing differences in role perception as well as role consensus. However, agents who are similar in personal characteristics such as age, education, and training tend to have similar perceptions of their roles (Warner, 1972; Aldrich and Pfeffer, 1976). Similarity in role perceptions would tend to enhance consensus (agreement) on some of their roles as extension agents. Also, based on their understanding of the complexity of the farmers' problems, high level extension officials tend to see a rather comprehensive set of roles for the field workers as necessary for improving the farmers' lot. Agents who perceive many important roles would, therefore, have greater role consensus with official role definitions than those who do not. It is hypothesized here that agents' role perceptions are related positively to their role consensus.

The anticipated relationships between role perception and role performance and role consensus are presented below:



Role consensus

In this study, role consensus is the degree of agents' agreement with official ratings of the importance of duties and responsibilities of extension agents.

Variability in behavior has been accounted for by invoking such variables as different motivations, attitudes, or personality characteristics. However, the research experience of Gross et al. (1958) suggests that different expectations and perceptions held for incumbents' behavior and attributes are crucial for an understanding of their different behaviors and characteristics. Role theory generally assumes that consensus exists on the behavior expectations and perceptions of position incumbents. Empirically, however, there are degrees of consensus on the expectations which can be inferred from the percentage of respondents or role definers who agree on the expectations. The theoretical and practical implications of differential degrees of consensus on role definition and role performance for the functioning of social systems, the organizations, the behavior of individuals, and the cultural organization of a society have apparently received only slight attention (Gross et al., 1958).

Klonglan et al. (1967) defined "consensus" as the correspondence (or agreement) between two different sets of role definitions for a given position. For example, it would be said that there is low consensus between extension agents and top extension officials if the agents define the role of an extension agent differently than the officials might. Gross et al. (1958) make a distinction between intra- and interposition consensus. Intraposition consensus is the extent of variability in the role definitions of incumbents of the same position, while interposition consensus is the agreement and disagreement between two sets of role definers, e.g., extension agents and the top officials. There are also

two types of microscopic consensus among group members--consensus among incumbents of a single position and consensus between incumbents of two positions (Gross et al., 1958).

Role consensus and role performance According to Haas and Drabek (1973), to the extent that there is not complete consensus among group members in role conception regarding the relevant roles, there will be a decided lack of meshing in the resulting interaction and activity being attempted. And, as complete consensus probably never occurs, there always is some degree of mismatch. The lower the level of consensus, the more incongruous become the various attempts at interaction and activity or role performance. Lower consensus levels tend to lead to interaction attempts that may be defined as "confusion" or "conflict." The kinds of behavioral consequences expected to flow from low role consensus include friction, disharmony, conflict, and negative sanction. Haas (1964) found empirical indications that for groups which persist over time, the lower the level of group role consensus, the higher the incidence of friction. Gross et al. (1958), on the other hand, investigated the role definitions held by 105 paired units of school superintendents and school board members serving in Massachusetts during the early 1950s and concluded that a board whose members agree among themselves on the expectations for their own and the superintendent's positions will rate the superintendent highly on how well he performs his job, whether or not they agree with the superintendent on the role definitions for his and their positions. According to Kanter and Brinkerhoff (1981), performance and accurate evaluation of performance are affected in cases where there is little

consensus in tasks or what is to be done. Studies, therefore, show strong indications of a positive relationship between role consensus and role performance. Hence, it is hypothesized in the present study that agents' role consensus is related positively to their role performance.

The anticipated relationship between role consensus and role performance is presented as follows:

Role consensus $\xrightarrow{+}$ Role performance

Role performance

Performance is defined as activity which produces an outcome (Brumback et al., 1978). Role performance would, therefore, be conceived as activities of an incumbent of a given position which are aimed at producing certain desired outcomes or impact. In their study of how husbands and wives rank the importance of their roles and how each in turn rates his/her performance in each role, Schafer et al. (1976) described roles as involving a pattern of behavior including duties and responsibilities and certain rights.

There are two dimensions to the concept of role performance--the quantity and the quality dimensions. The quantity aspect is the number or scope of role activities performed, while the quality aspect refers to the degree or effectiveness of the roles performed. Much of the literature cited in the literature review on role performance deals mainly with the quality dimension. The quantity aspect is largely implied or taken for granted and only tangentially referred to in the discussion of role performance(s). However, the quantity side of role performance was explicitly used by Akinbode (1971).

Perhaps the most fundamental role activity of agricultural extension agents is the transference and diffusion of information and knowledge about new or improved farm technologies. Several studies have been done on role performance and perception in the United States which have implications for the roles of extension agents in Nigeria (Akinbode, 1971). One of such studies may be the nationwide study of county extension agents' work in the United States by Brumback et al. (1978). In this study, it was found that approximately 2,500 descriptions of job-related behaviors and other work outcomes were mentioned. These descriptions were culled, edited, and classified into 14 descriptions or duty areas. These are (1) assess community needs, (2) prepare annual plan of work, (3) prepare specific program plans, (4) conduct programs, (5) provide specific information on request, (6) provide specific technical assistance on request, (7) recruit, train, and utilize lay leaders, (8) evaluate program effectiveness, (9) report activities, impact, and accomplishments, (10) develop and maintain public relations, (11) develop and maintain staff relationships, (12) maintain and increase personal professional competencies, (13) perform administrative functions, and (14) supervise staff. In Wilkening's (1957) study of county extension agents in Wisconsin, it was found that the agent performed several roles which he categorized as (1) consultant, (2) public (or program) administrator, (3) salesman of information and ideas, (4) students, (5) organizer of groups, (6) organizer and supervisor of events, and (7) facilitator or service agent.

In Nigeria, Akinbode (1971) identified 30 role activities of extension agents using records of the Ministry of Agriculture and Natural Resources, information from agents themselves, and his personal experience. He then presented the list of these activities to the divisional Extension Officers in the western part of Nigeria to identify those roles they performed and to rank order them according to their importance. The 30 role activities were, in order of their identified importance: (1) providing farmers with information, (2) holding meetings, (3) writing official letters, (4) writing reports, (5) making home and farm visits, (6) providing information on sale of farm produce, (7) training, (8) data collection, (9) input distribution, (10) conducting method and result demonstrations, (11) developing calendar of work, (12) discussing farmers' problems, (13) evaluating programs, (14) enforcing government regulations, (15) office calls by farmers, (16) training local leaders, (17) securing extension teaching materials, (18) preparing, checking, and signing vouchers, (19) attending official meetings, (20) slave driving of subordinates, (21) conducting demonstrations at extension stations, (22) providing information on government credit, (23) discussing personal nonfarm problems with farmers, (24) preparing production forecast, (25) assisting researchers in conducting surveys, (26) arranging for tractor hiring for farmers, (27) touring, (28) preparing weather forecast, (29) arranging for land acquisition for government projects, (30) attending to contractors in the office.

Role performance and role impact According to Wang (1983), when the role of extension is fulfilled, there would be "results,"

"achievements," "accomplishments," "effects," or "consequences" of agricultural extension services. Change agents should, therefore, recognize their responsibility for the consequences of the innovations that they introduce. They should be able to predict the advantages and disadvantages of an innovation before introducing it to their clients, but this is seldom done (Rogers, 1983). In fact, one of Rogers' (1983:390) generalizations of adoption behavior is that "Change agents can more easily anticipate the form and function of an innovation for their clients than its meaning."

The most fundamental role of agricultural extension service may be to transfer and diffuse for actual application to the farmer-clients innovative agricultural technology to facilitate agricultural and rural development for national development as a whole (Wang, 1983). Accordingly, perhaps the most important impact of extension agents would be the rate of adoption of new and improved technology. However, factors or variables impinging upon the degree of role performance and fulfillment of agricultural extension services have been identified and considerably discussed. These include infrastructure, political commitment, and resources on the macro side, and managerial and behavioral variables like staff quality, felt needs, and participation on the micro side (Jedlicka, 1977).

Impact of performed roles can be affected by several other factors such that the desired or specified outcomes might not be attained. First, where there seems to be not much correspondence between performed role activities and expected or specified impacts, the performed role

activities would tend to have only tangential impacts. For example, dissemination of agricultural information in the rural areas might have only indirect and low effect on rural-urban migration or rural poverty. Second, many role activities could be performed, but none might be well-performed. And, third, some persons might perform the activities well, while others perform them poorly. All of these factors would tend to have moderating influence on the impacts or perceived impacts of performed roles.

Rossi et al. (1979) found that a large proportion of programs that fail to show impacts are really failures to deliver (perform) interventions (programs) in ways specified. The authors list three potential failures: (1) little or no program is deliverable to the clientele, (2) the wrong program is delivered, and (3) the program is uncontrolled, unstandardized, or varies across target populations. Accurate measurement of both program processes and individual performance in carrying out those processes should contribute to a more accurate appraisal of program impact (Ladewig, 1983). Also, according to Iwueke and Findlay (1980), the methods employed by an extension worker to inform farmers about new farm practices directly affect the effectiveness of his effort. Success of the extension worker's work is dependent on the type and intensity of the methods (activities) he or she uses to pass information to farmers and to persuade them to adopt new farm practices. In general, indications are that role performance and role impact covary. It is hypothesized in this study that agents' role performance is related positively to their role impact.

The expected relationship between role performance and role impact is presented as follows:

Role performance $\xrightarrow{+}$ Perceived role impact

Hypotheses of the Model

The role and organization theories serve as the basis for the heuristic model of role impact (Figure 1). The expected relationships in the model, which were derived from the theoretical and empirical literature on extension, are listed below. The listing is organized according to the specific dependent variables which are being tested in the causal (path) model.

1. Hypothesis linking the independent variable to role impact.
    1.1. Role performance of the extension agent is related positively to perceived role impact.
2. Hypotheses linking the independent variables to role performance.
    2.1. Age of the extension agent is related positively to role performance.
    2.2. Educational attainment of the extension agent is related positively to role performance.
    2.3. Training received by the extension agent is related positively to role performance.
    2.4. Job tenure of the extension agent is related positively to role performance.
    2.5. Rank of the extension agent is related positively to role performance.

2.6. Job satisfaction of the extension agent is related positively to role performance.

2.7. Attitude of the extension agent toward farmers and rural life is related positively to role performance.

2.8. Agent perception of the decision making of the extension organization is related positively to role performance.

2.9. Agent perception of planning in the extension organization is related positively to role performance.

2.10. Agent perception of personnel policies in the extension organization is related positively to role performance.

2.11. Role perception of the extension agent is related positively to role performance.

2.12. Role consensus of the extension agent is related positively to role performance.

3. Hypotheses linking the independent variables to role consensus.

3.1. Age of the extension agent is related positively to role consensus.

3.2. Educational attainment of extension agent is related positively to role consensus.

3.3. Training received by the extension agent is related positively to role consensus.

3.4. Job tenure of the extension agent is related positively to role consensus.

3.5. Rank of the extension agent is related positively to role consensus.

3.6. Job satisfaction of the extension agent is related positively to role consensus.

3.7. Attitude of the extension agent toward farmers and rural life is related positively to role consensus.

3.8. Agent perception of the decision making of the extension organization is related positively to role consensus.

3.9. Agent perception of planning in the extension organization is related positively to role consensus.

3.10. Agent perception of personnel policies in the extension organization is related positively to role consensus.

3.11. Role perception of the extension agent is related positively to role consensus.

4. Hypotheses linking the independent variables to role perception.

4.1. Age of the extension agent is related positively to role perception.

4.2. Educational attainment of the extension agent is related positively to role perception.

4.3. Training of the extension agent is related positively to role perception.

4.4. Job tenure of the extension agent is related positively to role perception.

4.5. Rank of the extension agent is related positively to role perception.

4.6. Job satisfaction of the extension agent is related positively to role perception.

4.7. Attitude of the extension agent toward farmers and rural life is related positively to role perception.

4.8. Agent perception of decision making of the extension organization is related positively to role perception.

4.9. Agent perception of planning in the extension organization is related positively to role perception.

4.10. Agent perception of personnel policies of the extension organization is related positively to role perception.

CHAPTER IV. PROCEDURES

The research procedures used in the study are described in this chapter. These include a discussion of methods employed in collecting the data, the sampling procedures and sample sizes, the techniques used in measuring the theoretical concepts, and the statistical procedures employed in analyzing the data.

Data Collection

The present study was conducted in Zone III of the four agricultural development zones of Kaduna State of Nigeria. With Maigana as its zonal administrative headquarters, Zone III is divided into ten development areas, namely: Soba, Makarfi, Birnin-Gwari, Ikara, Kuyello, Kaduna, Zaria, Rigachukun, Auchan, and Giwa.

Zone III was selected as the area for this study because of a number of considerations. First, the researcher and the interviewers had prior research experience in this area and had already established good rapport with the people they had worked with. Second, there are more data and information available to the researcher from different places within the zone than in any of the other zones. It was anticipated, rightly, that these would be useful in the course of the study. Third, it is the most accessible of the four zones in the state, since the university in which the researcher works is located almost centrally within the zone. It was, therefore, economical to conduct research in this area considering the budget and time constraints within which the researcher was operating.

Field work started in August and was completed in December 1982. The principal method used for collecting data was survey design. A questionnaire instrument was administered in face-to-face interviews with the respondents by enumerators of the Department of Agricultural Economics and Rural Sociology, Institute for Agricultural Research (I.A.R.), Ahmadu Bello University (A.B.U.), Zaria. Other secondary methods for obtaining additional information were discussions and unstructured interviews with government officials, community leaders, and other knowledgeables. Also, written documents and personal observation provided additional valuable information for the study.

The Sample

The population for this study was extension agents operating in the selected zone. The units of analysis were the individual extension agents within this zone.

The sample frame was a list of all extension agents in Zone III obtained from the zonal office. The number of extension agents interviewed was 112 out of a total population of 115 in the zone.

Measurement of Variables

The concepts included in the theoretical model in Figure 1 were measured by either single measure or composite measure techniques. The single measure technique uses only one question or indicator to measure the domain of a concept. The composite measure approach combines several questions to build a summary score, scale, or index for the concept.

The independent variables include 1) a group of agent characteristics, (2) organizational factors, (3) role perception, (4) role consensus, and (5) role performance. Role impact serves as the ultimate dependent variable. The measures for each of the concepts within these five categories are discussed below. All measures that are described have been derived from the questionnaire included in Appendix A. Frequency distributions and associated descriptive statistics for the variables are reported in Chapter V.

Agent characteristics

Variables that were operationalized to represent the characteristics of the extension agent are (1) age, (2) education, (3) job tenure, (4) rank, (5) job satisfaction, and (6) attitude.

Age The indicator for age was a two-digit variable. It indicated age in years of the extension agent (question 8, Appendix A).

Education The educational attainment of the extension agent was represented by six educational levels. Five of these are listed in question 18, Appendix A. Two levels, post-primary school and post-graduate studies, emerged from agents' responses to "Others" in the same question. Two other educational levels, Ordinary National Diploma and Higher National Diploma, were identified in the school of agriculture level. But Higher National Diploma and university degree levels were merged into one educational level in the analysis, because they are officially considered to be equivalent to one another. A score of one indicates that the agent had completed primary school or less. A score of six represents the completion of post-graduate studies. Scores of two,

three, four, and five identify the agent as having completed (1) post-primary school certificate course, (2) secondary school/General Certificate of Education (Ordinary Level/Teachers' College, (3) College of Agriculture (Ordinary National Diploma), and (4) College of Agriculture (Higher National Diploma/university degree), respectively.

Training In-service training of the extension agent was measured as the number of in-service training programs that the agent had attended in his/her entire extension career (question 55, Appendix A). Length and intensity of training was not considered in this measure.

Job tenure The job tenure of the extension agent was measured by the number of years the agent had been on the job of extension work (question 23, Appendix A).

Rank The rank of the extension agent was represented by his/her official position or title in the extension organization (question 27, Appendix A). The titles obtained from the agents were ranked and scored as follows: 1-Ag Instructor; 2-Mechanical Assistant; 3-Assistant Ag Superintendent; 4-Ag Superintendent; 5-Higher Ag Superintendent; 6-Development Officer/Ag Officer/Demonstration Officer/Farm Management Officer; 7-Senior Development Officer; and 8-Principal Ag Officer.

Job satisfaction This variable was created from seven items on the extension agent satisfaction with his/her job. The items included: (1) "Salary," (2) "Opportunity for promotion," (3) "Fringe benefits," (4) "Facilities for doing the job," (5) "Respect which others have for your job," (6) "Communication with your supervisor," and (7) "Communication with farmers." Each item was scored from zero to two, with zero

representing "Dissatisfaction" and two indicating "Very satisfied." By adding up the points from these seven items, the possible total score for the scale of job satisfaction for each extension agent ranged from zero to fourteen. The higher the score, the greater the job satisfaction of the extension agent (question 32, items 1-7, Appendix A).

Attitude This variable was represented by eight items about the attitude of the extension agent toward farmers. Negative, neutral, and positive responses were scored as zero, one, and two, respectively. Scores on these items were used as indicators of the agent's attitude toward farmers. The possible range of scores was from zero to 16, with zero indicating a completely negative attitude and 16 representing the most positive attitude. The higher the score, the more positive attitude the agent had toward farmers (question 65, items 1-8, Appendix A).

Organizational factors

Factors that were operationalized to represent the characteristics of the extension organization include (1) decision making, (2) planning, and (3) personnel policies.

Decision making The amount of influence that certain individuals or groups of individuals were perceived by extension agents to have on extension policy decisions was the basis for operationalizing this concept. A list of seven categories was used, including: (1) "Chief Extension (Technical) Officer," (2) "Zonal Extension Officer," (3) "Development Officer," (4) "Ag Instructors," (5) "Farmers/farmers organizations," (6) "Rural women," and (7) "Rural Youth Clubs." How much influence each of these groups had for decision making in extension was

scored from zero to two, with zero denoting "None," one representing "Some influence," and two indicating "Great influence." The scale, then, has a range of possible scores from zero to 14 (question 45, Appendix A).

Planning The planning variable was represented by three items about program planning which relate to specification of program activities, scheduling of program activities, and planning day-to-day activities. The three item questions were: (1) "Is extension organized along specific programs/activities?" (2) "Are the programs/activities organized (or phased out) along specific time periods?" and (3) "Do you always have your written work program, i.e., calendar of work?" Responses were scored as one for "Yes" and zero for "No" responses. By summing up the points from these three questions, the possible range of scores is from zero to three. The higher the score, the greater the perceived planning adequacy of the extension organization (questions 46, 48, and 50, Appendix A).

Personnel policies This concept was initially created from seven items representing various aspects of extension personnel policies. These aspects include socialization, supervision, incentive, size, qualifications, and general work conditions (questions 51, 53, 54, and 56a-d, Appendix A). Specific item questions were: (1) "When you took up the extension job, were your responsibilities (duties) made known to you?", (2) "Were the responsibilities of your junior and senior officers officially made known to you?", (3) "Would you say that supervision on your work by your supervisors is 1. Adequate? 2. Inadequate?", (4) "Your promotion depends on how much extension work you do," (5) "There are

enough extension workers in the state," (6) "The extension workers in the state have adequate qualifications and skills," and (7) "Generally, conditions of work in extension are good." A code of one represented "Yes" or "Agree" responses which were scored as one, while a code of two meant "No" or "Disagree" and was scored zero. By adding together the scores of the items, the scale has a range of possible total scores from zero to seven. The higher the score, the greater the perceived adequacy of personnel policies of the extension agency.

Role of the extension agent

Elements of the role of extension agent in this study include role perception, role consensus, role performance, and role impact.

Role perception This concept was measured by the total number of activities recognized by an extension agent as the responsibilities of extension workers out of a list of 12 formally designated role activities of extension agents (question 1, Appendix A). The possible range of scores was between zero and 12, with zero indicating that none of the 12 activities was considered to be the duties of extension agents and 12 indicating that all the activities were considered to be the responsibilities of extension agents. The higher the score, the greater the role perception.

Role consensus Twelve question items on agent role activities were all scored by selected top extension officers in the state as being "Of much importance" (question 3, Appendix A). The sum of these ratings was used to determine the degree of importance placed on the role of extension agents. The scores for each item were one to five, with one

indicating "Of no importance at all" and five for "Of very much importance." Two, three, and four stand for "Of little importance," "Not little, not much importance," and "Of much importance," respectively. By summing up the points from the 12 scale items, the possible range of scores was 12 to 60. The higher the score, the greater the role consensus of the agent with officials.

It is, however, conceivable that since the same items used for role consensus were used for role perception, there might be the possibility that responses on role perception might have influenced the responses on role consensus. Also, while consideration was given to the breadth or number of roles perceived by the agent, no attention was given to specifics in terms of which roles the agent perceived or did not perceive and what the agent's consensus was on each of the roles.

Role performance The variable was measured in terms of the scope or the number of extension activities which the agent actually performed during the previous year out of 12 role activities listed (question 1, Appendix A). Each activity performed scored one point. By summing up the scores for the 12 items, the possible total score for this scale ranged from zero to 12. The higher the score, the wider the scope of role performance.

It ought to be acknowledged that by using this quantity measure of role performance, account is not taken of the quality or effectiveness of the roles performed. Also not considered in this measure is how performance was affected by factors other than role perception and role consensus such as sufficiency or insufficiency of resources and

motivational factors. Furthermore, the nature of congruency between role perception and role performance, as well as role consensus and role performance, would not be understood because an agent's performed roles may or may not be among the agent's perceived roles or the agent's high consensus roles, respectively.

Role impact Seventeen anticipated or perceived impacts of extension work on agricultural and rural development represented this concept. The amount of impact of each of the 17 impact items was scored from one ("Nil") to five ("Very much"). Thus, the scale has a possible range of scores from 17 to 85 (question 7, Appendix A).

Role impact was considered as the consequence of role performance. However, it should be noted that while some role impact items (question 7, Appendix A) seem obviously associated with role performance items (question 1, Appendix A), others are not. For example, awareness of recommended practices seems to be directly related to dissemination of agricultural information, but none of the performed items appears to be directly related to some of the impact items such as reduction in rural-urban migration and elimination of rural poverty. It is presumed, however, that performance of the various extension roles would lead to the identified impacts, directly or indirectly.

Statistical Procedures

Statistical analyses in this study include two major sections. The first is a descriptive section of the basic characteristics of the sample. In this section, frequencies, percentages, and means are presented.

The second section uses path analysis procedures (Duncan, 1966; Asher, 1976) to test the proposed (exploratory) model of relationships that were hypothesized in the preceding chapter. Path analysis technique is a statistical tool which employs multiple linear regression for assessing causal inferences. As an extension of multiple regression technique (Wright, 1921), path analysis provides a more explicit causal relationship not only between one independent variable with a dependent variable, but also between a set of independent variables and the dependent variables (Miller, 1981). Secondly, it generated coefficients which can be interpreted as measures of cause-effect relationships among the relevant independent variables in the model.

The basic assumptions of path analysis are derived from those of multiple regression (Miller, 1981). These are (1) the sample units are independently drawn, (2) the variables are measured on an interval scale, and (3) the variances are equal (homoscedasticity). Further assumptions of path analysis are that (1) there is no problem of high level of multicollinearity among the independent or exogenous variables (Nie et al., 1975), (2) the causal model posits linear, additive, asymmetric relationships among the variables, i.e., no reciprocal causation or feedback loop (Duncan, 1966), (3) measures of variables in the model are reliable (Warren et al., 1977), and (4) the disturbances (error terms) of the dependent variables are not correlated with each other or with the independent variable (Miller, 1981).

However, emphasis on these assumptions varies. For example, Miller (1981) asserts that multicollinearity problems among the independent

variables have been frequently given less attention than the three basic assumptions derived from multiple regression. Also, while most proponents of this procedure (e.g., Blalock, 1964; Duncan, 1966; Land, 1969) emphasize that the measurement of variables must be that of an interval measurement, Miller (1981) would also consider a measurement which is approximately interval. Sulaiman (1981) and Salama (1983) measured education as a variable in terms of categories such as "No schooling," "Completing elementary level," "Completing junior high level," "Completing high school," "Completing college level," and "Completing the graduate level." Other variables that are not strictly measured in the interval level are also employed in path analysis. Among them are marital status (Sulaiman, 1981) in terms of categorical level of single and married, and sex in terms of male and female dichotomous measure.

Even though Wilson (1971) considers and recommended that the interval measurements will indeed be more precise in the prediction capabilities of the set of exogenous variables on the dependent variables in a causal model, some researchers such as Labovitz (1970), Boyle (1970), Smith (1972), and Sulaiman (1981) counter-assert that the use of categorical or ordinal measurement can be substituted for interval variables in causal analysis without risking any major error or problems of interpretation.

Path analytical technique involves several procedures which are systematically carried out (Warren et al., 1968; Lin, 1976). The first step taken in this study was to symbolize the variables in the following way:

Age	AGE	(X_1)
Education	EDUC	(X_2)
Training	TRAIN	(X_3)
Job tenure	JOBYRS	(X_4)
Rank	RANK	(X_5)
Job satisfaction	JOBSAT	(X_6)
Attitude	ATT	(X_7)
Decision making	DMAKING	(X_8)
Planning	PLANNIN	(X_9)
Personnel policies	PERSONL	(X_{10})
Role perception	PERC	(Y_1)
Role consensus	CONS	(Y_2)
Role performance	PERF	(Y_3)
Role impact	IMPACT	(Y_4)

Then, a path diagram of the posited causal patterns was drawn (Figure 2). In this model, independent or exogenous variables are those variables that are assumed to be determined by factors outside the causal model. There are ten of these variables, namely: age, education, training, job tenure, rank, job satisfaction, attitude, decision making, planning, and personnel policies. The first seven variables are agent characteristics, while the last three are organizational factors. The dependent or endogenous variables are those whose variability is accountable to both the independent and some dependent variables in the model. Thus, the model contains three dependent variables: role perception, role

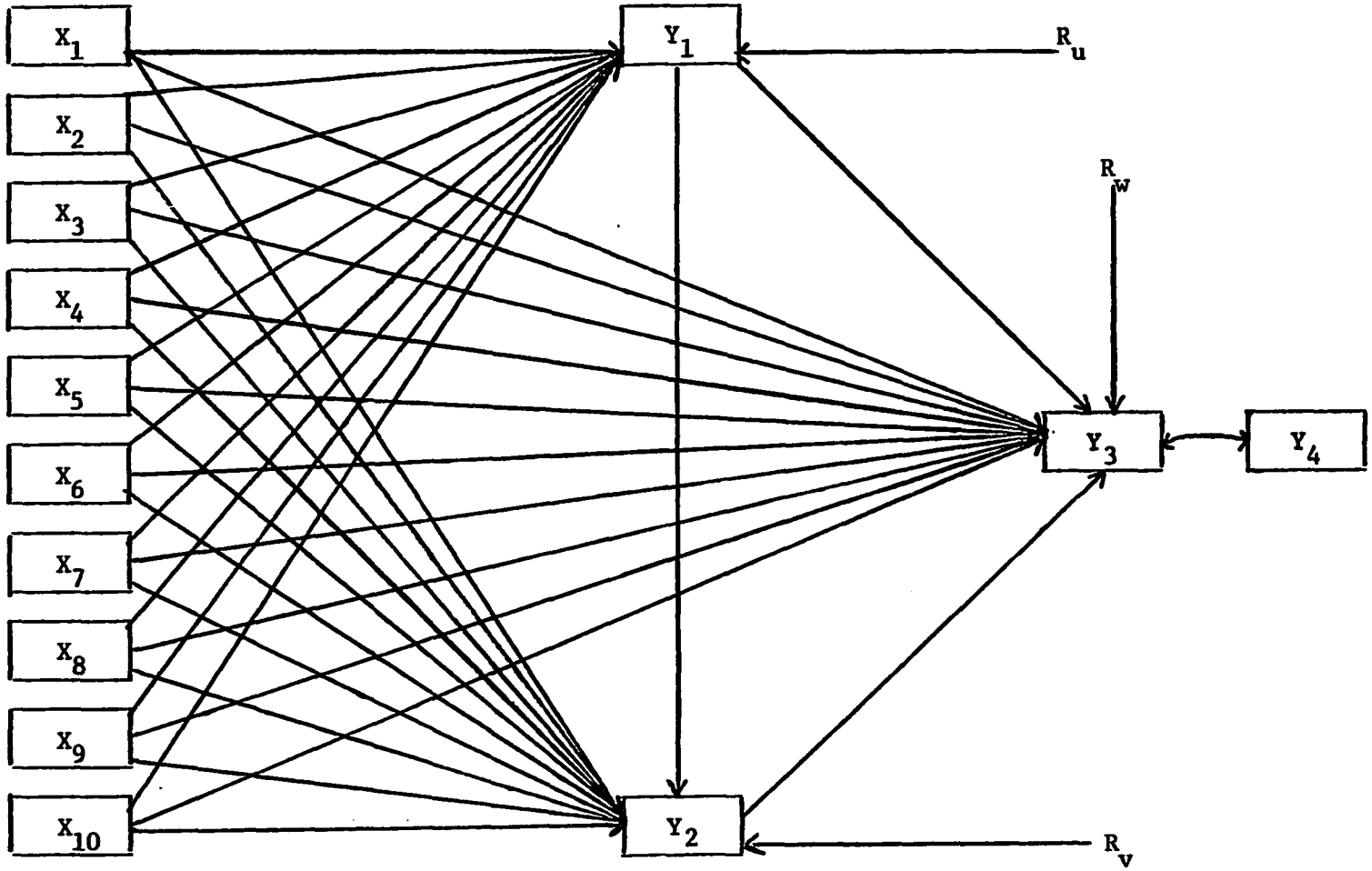


Figure 2. The path diagram (variable numbers correspond with the list of variable names on page 88)

consensus, role performance. There is also a bivariate relationship between role performance and role impact.

The hypothesized causal links in the path diagram (Figure 2) between variables are indicated by unidirectional arrows from independent to dependent variables. The interrelationships among the independent variables, usually indicated by two-headed curved arrows, were not included in the path diagram in order to simplify the figure. Residual variables (R_i's) are shown by one-way arrows from each residual variable to its dependent variable. The residual or disturbance terms (R_i's) are the unmeasured or unknown factors that affect the dependent variable (Asher, 1976). Finally, the association between role performance and role impact is represented by a two-headed curved arrow.

The recursive equations for the dependent variables represented by the paths in the model are presented as follows:

$$Y_1 = P_{11}X_1 + P_{12}X_2 + P_{13}X_3 + P_{14}X_4 + P_{15}X_5 + P_{16}X_6 + P_{17}X_7 + P_{18}X_8 + P_{19}X_9 + P_{1.10}X_{10} + P_{1u}R_u$$

$$Y_2 = P_{21}X_1 + P_{22}X_2 + P_{23}X_3 + P_{24}X_4 + P_{25}X_5 + P_{26}X_6 + P_{27}X_7 + P_{28}X_8 + P_{29}X_9 + P_{2.10}X_{10} + P_{2.11}X_{11} + P_{2v}R_v$$

$$Y_3 = P_{31}X_1 + P_{32}X_2 + P_{33}X_3 + P_{34}X_4 + P_{35}X_5 + P_{36}X_6 + P_{37}X_7 + P_{38}X_8 + P_{39}X_9 + P_{3.10}X_{10} + P_{3.11}X_{11} + P_{3.12}X_{12} + P_{w}R_w$$

where P_{ij}'s are the path coefficients (i=the dependent variable, j=the independent variable) and R_i's are the residual variables. Regressions for each of these equations are obtained for path analysis. These regressions are articulated until the model contains only significant

paths. The model containing only significant paths is called the reduced or revised model. This (over-identified) model is tested by using χ^2 (chi-squared) test of significance to see whether or not it fits the data (Pedhazur, 1982). The reduced model (Figure 3) was found to fit the data.

With path analysis, direct and indirect effects of variables on one another can be measured using the partial regression coefficients. Alwin and Hauser (1975) defined direct, indirect, and total effect of one variable on another. The direct effect of a variable on another is that part of its total effect which is not transmitted through intervening variables. Thus, this effect remains when intervening variables are held constant. Indirect effects are those parts of a variable's total effect which are transmitted or mediated by intervening variables. Total effect is the summation of direct and indirect effects. This represents the amount of change in a consequent variable induced by change in the antecedent variable.

Statistical coefficients which are required in path analysis are (1) Pearsonian zero-order correlation coefficients, (2) partial regression coefficients, and (3) coefficient of determination (R^2). Zero-order correlations are used in path analysis to evaluate the bivariate relationships between variables in terms of the strength and the directions of these relationships (Wright, 1979), and to obtain the simple correlations among the exogenous variables as part of a path diagram. In this study, the .05 level of significance was used in evaluating the bivariate relationships among variables.

Partial regression coefficients are estimates of the effect of each of the independent variables on a given dependent variable when holding the effects of other variables constant (Wright, 1979). For path analysis, F-values and levels of significance of these coefficients are used for determining which variables to delete from the regression equations. The full model is progressively revised to ultimately include only significant paths. The partial regression coefficients in the present study were evaluated at the .10 level of significance.

Partial regression coefficients are of two types. One is the standardized partial regression coefficients referred to as path coefficients or betas (β's). The other is unstandardized partial regression coefficients also termed path regressions and symbolized as b's. Path coefficients are used (1) for assessing the relative amount of variance explained in a dependent variable by various independent variables, and (2) if the independent variables are measured in different units and the important concern is in assessing the overall effect of one variable on another in the same sample/population. Unstandardized partial regression coefficients are used for making comparisons between different populations or periods in longitudinal studies (Blalock, 1971; Heise, 1975). In this study, standardized partial regression coefficients (betas) were used to evaluate relationships among the variables in the full model, to examine direct and indirect effects, and to report path coefficients in the path diagram.

Coefficient of determination is the squared multiple correlation coefficient (R^2) and represents the overall accuracy of the prediction

equation. Specifically, R-squared indicates the amount of variance in the dependent variable explained by the independent variables in the regression equation. The higher the value of R^2, the greater the amount of explained variance. The F-value and level of significance for each regression equation are obtained using multiple regression program ($SPSS_X$, 1983). When R^2 is less than one, a residual or error term, which is the square root of the unexplained variance or $\sqrt{1-R^2}$ (Miller, 1981), must be employed. This is represented by R_i's in the path diagram. The residual path coefficient is a measure of the proportion of the standard deviation of the dependent variable. Its square measures the proportion of the variance of the dependent variable caused by all unmeasured variables not explicitly included in the set of independent variables in the path model (Miller, 1981).

CHAPTER V. DATA ANALYSIS

The purpose of this chapter is to report the findings of the data analysis. Two major sections are included. First, a descriptive analysis of the characteristics of agent respondents is provided. This covers Objectives 1 and 2 of this study. Secondly, the hypothesized relationships that are outlined in the theoretical model of role impact (Objective 3) are empirically tested.

Characteristics of the Sample

The characteristics of the agents are described using mostly frequencies, percentages, and means in several major areas: (1) agent characteristics, (2) organizational factors, (3) role perception, (4) role consensus, (5) role performance, and (6) role impact. The data were collapsed into categories for description purposes.

Agent characteristics

The selected agent characteristics are age, education, job tenure, rank, job satisfaction, and attitude.

Age Ages among extension agents studied range from 18 to 56. By classifying the respondents into three age categories, young agents aged 18 to 30 make up 41.1 percent, while middle-aged agents (31-40 years) represent 40.2 percent. Agents 41 years and older account for the remaining 18.7 percent (Table 1).

Education Table 2 shows the distribution of agents by level of formal educational attainment. The respondents' educational attainment levels range from primary school to post-graduate studies. The highest

Table 1. Distribution of extension agents according to age

Age in years	Number of respondents	Percent	Cumulative percent
18-30	46	41.1	41.1
31-40	45	40.2	81.3
41 and above	21	18.7	100.0
Total	112	100.0	

Table 2. Distribution of agents according to their level of educational attainment

Educational attainment	Number of respondents	Percent	Cumulative percent
Primary school	8	7.1	7.1
Post-primary school certificate	32	28.6	35.7
Secondary school/ Teachers' College	25	22.3	58.0
Ordinary National Diploma	28	25.0	83.0
Higher National Diploma/university degree	18	16.1	99.1
Post-degree	1	.9	100.0
Total	112	100.0	

level for most of the agents (58.0 percent) was secondary school/Teachers' College. A plurality of the agents (28.6 percent) had post-primary school certificate education.

Training Distribution of agents by their attendance at in-service training programs is shown in Table 3. The number of in-service training events in which agents participated ranged from 0 to 4. Out of the 112 agents in the sample, 37 or 33.0 percent had no in-service training, while 45 or 40.2 percent had medium (1-2) in-service training, and 30 or 26.8 percent scored high (3-4) on in-service training.

Table 3. Distribution of agents by their attendance at in-service training

In-service training	Number of respondents	Percent	Cumulative percent
None	37	33.0	33.0
Medium (1-2)	45	40.2	73.2
High (3-4)	30	26.8	100.0
Total	112	100.0	

Job tenure The number of years agent respondents had worked as extension agents ranged from a minimum of 1 to a maximum of 25. Approximately 35 percent of the sample had been working with the extension service agency for between 1 and 4 years and the same percentage (about 35 percent) had been working for between 5 to 8 years as extension workers. The rest (30.4 percent) of the respondents had been in the extension service for more than 8 years (Table 4).

Table 4. Distribution of agents according to years of job tenure

Years of extension work	Number of respondents	Percent	Cumulative percent
1-4	39	34.8	34.8
5-8	39	34.8	69.6
More than 8	34	30.4	100.0
Total	112	100.0	

Rank Positional rank scores of the agent respondents in the extension organization ranged from 1 (Agricultural Instructor) to 9 (Principal Agricultural Extension Officer). Nearly 40 percent were in the category of low rank, while 50.0 percent were in the medium rank group. The remaining 10.7 percent were in the high rank category (Table 5).

Table 5. Distribution of agents according to rank

Rank	Number of respondents	Percent	Cumulative percent
Low (1-2)	44	39.3	39.3
Medium (3-5)	56	50.0	89.3
High (6-8)	12	10.7	100.0
Total	112	100.0	

Job satisfaction In Table 6, percentages and mean scores of job satisfaction items show that the three items which agents were most dissatisfied with were facilities (48.2%; $\bar{X}$=0.7), benefits (44.6%; $\bar{X}$=0.7), and promotion (37.5%; $\bar{X}$=0.8). On the other hand, agents were very

satisfied with communication with farmers (56.2%; $\bar{X}$=1.4), followed by communication with superiors (48.2%; $\bar{X}$=1.4), and then respect (41.1%; $\bar{X}$=1.3). This suggests that the greatest job satisfaction of extension agents is derived from their farmer clients.

Table 6. Distribution of agents according to job satisfaction items

Items of satisfaction	Dissatisfied		Somewhat satisfied		Very satisfied		Mean score
	Number	Percent	Number	Percent	Number	Percent	
Salary	31	27.7	56	50.0	25	22.3	1.0
Promotion	42	37.5	50	44.6	20	17.9	0.8
Benefits	50	44.6	45	40.2	17	15.2	0.7
Facilities	54	48.2	43	38.4	15	13.4	0.7
Respect	15	13.4	51	45.5	46	41.1	1.3
Communication with superiors	15	13.4	43	38.4	54	48.2	1.4
Communication with farmers	16	14.3	33	29.5	63	56.2	1.4

By categorizing the agents on job satisfaction index, almost 30 percent had low satisfaction, while nearly one-third (54.5%) had medium satisfaction. The remaining 16.0 percent had high satisfaction (Table 7).

Table 7. Distribution of agents on job satisfaction index

Index	Number of respondents	Percent	Cumulative percent
Low (1-5)	33	29.5	29.5
Medium (6-10)	61	54.5	84.0
High (11-14)	18	16.0	100.0
Total	112	100.0	

Attitude Attitudes of agents toward small scale farmers and rural areas are examined in Table 8. On the categories of low, medium, and high attitudes, the respondents tend to spread over in nearly equal numbers. A plurality (47.3%) of the agents had medium positive attitude, 33.0 percent had low attitude, and another 19.7 percent had high attitude.

Table 8. Attitude of the agents toward the small farmers and rural areas

Agent attitude	Number of respondents	Percent	Cumulative percent
Low (2-6)	37	33.0	33.0
Medium (7-11)	53	47.3	80.3
High (12-16)	22	19.7	100.0
Total	112	100.0	

Organizational factors

Three organizational factors considered in this study are (1) decision making, (2) planning, and (3) personnel policies.

Decision making The extent to which various groups and individuals participate in the decision making of the extension organization is shown in Table 9. The mean scores show that rural women ($\bar{X}$=0.6) stand out as the group perceived as having the least influence in decision making, followed by rural youth ($\bar{X}$=1.0) and farmer organizations ($\bar{X}$=1.0). The Chief Extension Officer ($\bar{X}$=1.6) and the Zonal Extension Officer ($\bar{X}$=1.6) were followed by the Development Officer ($\bar{X}$=1.4) as having great influence in the decision making of the extension agency (Table 9).

Table 9. Distribution of agents according to their perception of participation in the decision making of the extension organization

Participators	Influence: None Number	None Percent	Some Number	Some Percent	Great Number	Great Percent	Mean score
Chief Extension Officer	9	8.0	25	22.3	78	69.6	1.6
Zonal Extension Officer	12	11.6	18	16.1	82	73.2	1.6
Development Officer	26	23.2	20	17.9	66	58.9	1.4
Agricultural Instructor	28	25.0	28	25.0	56	50.0	1.3
Farmer organizations	29	25.9	50	44.6	33	29.5	1.0
Rural women	61	54.5	36	32.1	15	13.4	0.6
Rural youth	32	28.6	53	47.3	27	24.1	1.0

The range of scores on agents' perception of the extent of participation in decision making in the organization was 0-14. By categorizing the agents' perception of decision making, 26.8 percent had low perception, 46.4 percent had medium perception, and 26.8 percent had high perception (Table 10).

Table 10. Distribution of the agents by their scores on perceived decision making of the extension organization

Agent score	Number of respondents	Percent	Cumulative percent
Low (0-6)	30	26.8	26.8
Medium (7-10)	52	46.4	73.2
High (11-14)	30	26.8	100.0
Total	112	100.0	

Planning Perceived degree of planning in the extension organization was classified in terms of three categories in Table 11. Of a total of 112 agents, 36.6 percent were found to be low in their perception of planning in extension, while 19.6 percent were found to have medium perception. Approximately 44 percent had high scores on their perception of planning.

Table 11. Agent perception of planning in the extension organization

Perception of planning	Number of respondents	Percent	Cumulative percent
Low (1)	41	36.6	36.6
Medium (2)	22	19.6	56.2
High (3)	49	43.8	100.0
Total	112	100.0	

Personnel policies Of the five items of staff policies of the extension organization considered in this study, 83 percent agreed that there was adequate staff supervision, while 53.6 percent agreed that the general conditions of extension work were good. However, a high percentage (79.5%) of the agents perceived the number of extension agents as being inadequate, followed by 50.9 percent who perceived that promotion did not depend on one's performance, and the same percentage (50.9%) perceived that the extension agents did not have adequate qualifications

and skills (Table 12). By classifying the respondents into three groups, it was found that 32.1 percent, 43.8 percent, and 24.1 percent have low, medium, and high scores on their perception of personnel policies, respectively (Table 13).

Table 12. Distribution of agents according to their perception of personnel policies of the extension organization

Areas of personnel policies	Yes		No	
	Number	Percent	Number	Percent
Adequate supervision	93	83.0	19	17.0
Promotion depends on one's performance	55	49.1	57	50.9
The number of extension agents is adequate	23	20.5	89	79.5
The extension agents have adequate qualifications/skills	55	49.1	57	50.9
The general conditions of extension work are good	60	53.6	52	46.4

Table 13. Agent perception of the personnel policies of the extension organization

Perceived personnel policies	Number of respondents	Percent	Cumulative percent
Low (1-3)	36	32.1	32.1
Medium (4-5)	49	43.8	75.9
High (6-7)	27	24.1	100.0
Total	112	100.0	

Objective 1: Impact of Agricultural Extension Agents

The perceived impact of the role activities of agricultural extension agents on agricultural and rural development in Kaduna State of Nigeria is the first objective of this dissertation. From the figures in Table 14, it can be seen that the three most mentioned indicators of agricultural and rural development to which agents have "nil" impact are, in descending order, availability of loans/credit (19.6%), reduction in rural-urban migration (19.6%), and elimination of rural poverty (12.5%). On the other hand, items with the highest scores for "very much" impact were widespread awareness of recommended farm practices (50.9%), higher crop production (22.3%), and availability of farm inputs (17.9%).

The mean scores (Table 14) show also that widespread awareness of recommended farm practices ($\bar{X}$=4.3), availability of farm inputs ($\bar{X}$=3.6), and higher crop production ($\bar{X}$=3.6) were perceived to be the strongest impacts of extension, while availability of loans and credit ($\bar{X}$=2.3), reduction in rural-urban migration ($\bar{X}$=2.7), and better home management ($\bar{X}$=2.8) were perceived to be the least impacts. Average impact items ($\bar{X}$=3.2) were widespread adoption of recommended farm practices and higher family income.

By categorizing impact scores into three groups, as shown in Table 15, agents with low scores of perception of impact represent 9.8 percent, while agents with high scores make up 8.0 percent. The bulk of the agents fall in the medium category and represent 82.2 percent. Thus, the impact of extension as perceived by the agents may be interpreted as moderate.

Table 14. Distribution of agents according to their perceived impacts of their role activities

Item	Impact										Mean score
	Nil		Little		Not little, not much		Much		Very much		
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%	
Widespread awareness of recommended farm practices	1	0.9	3	2.7	12	10.7	39	34.8	57	50.9	4.3
Widespread adoption of recommended farm practices	3	2.7	18	16.1	49	43.8	34	30.4	8	7.1	3.2
Availability of farm inputs	2	1.8	7	6.3	49	43.8	34	30.4	20	17.9	3.6
Availability of loans/credit	22	19.6	49	43.8	28	25.0	7	6.3	6	5.4	2.3
Higher crop production	4	3.6	9	8.0	45	40.2	29	25.9	25	22.3	3.6
Higher livestock production	4	3.6	28	25.0	43	38.4	30	26.8	7	6.3	3.1
Larger farm sizes	5	4.5	11	9.8	31	27.7	51	45.5	14	12.5	3.5
Better knowledge of marketing processes	7	6.3	34	30.4	37	33.0	21	18.8	13	11.6	3.0
Higher family income	10	8.9	13	11.6	42	37.5	38	33.9	9	8.0	3.2
Organization of more/ better youth clubs	6	5.4	28	25.0	44	39.3	19	17.0	15	13.4	3.1
Better home management	7	6.3	39	34.8	46	41.1	12	10.7	8	7.1	2.8
Organization of farmers co-ops	6	5.4	26	23.2	47	42.0	17	15.2	16	14.3	3.1
Favorable attitude toward farming	5	4.5	13	11.6	51	45.5	26	23.2	17	15.2	3.3

Table 14. Continued

Item	Impact										Mean score
	Nil		Little		Not little, not much		Much		Very much		
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%	
More and better social services	10	8.9	27	24.1	35	31.3	25	22.3	15	13.4	3.1
Self-help projects	5	4.5	33	29.5	39	34.8	23	20.5	12	10.7	3.0
Reduction in rural-urban migration	22	19.6	32	28.6	30	26.8	17	15.2	11	9.8	2.7
Elimination of rural poverty	14	12.5	26	23.2	38	33.9	24	21.4	10	8.9	2.9

Table 15. Agents' perception of the impact of their role activities

Perceived impact score	Number of respondents	Percent	Cumulative percent
Low (26-45)	11	9.8	9.8
Medium (46-65)	92	82.2	92.0
High (66-85)	9	8.0	100.0
Total	112	100.0	

In general, the mean scores (Table 14) indicate that items of agricultural and rural development that were perceived to have been least impacted by the agent role activities include availability of loans/credit, reduction in rural-urban migration, better home management, elimination of rural poverty, better knowledge of marketing processes, and self-help projects.

Items which were perceived to have been much impacted by the role activities of extension agents include widespread awareness of recommended farm practices, availability of farm inputs, higher crop production, large farm sizes, and favorable attitude toward farming.

Objective 2: The Role of the Extension Agent

The second objective of this study is to identify and examine the role of the extension agent in Kaduna State of Nigeria. In this case, role perception, role performance, and role consensus of extension agents are examined.

Role perception Data on role perception are presented in Table 16. In this table, it is shown that agent role perception scores ranged from 55 to 99. The perceived role with the highest score from the agents was holding meetings, home and farm visits (88.4%), followed by providing farmers with information (84.8%) and organizing community projects (82.1%). The least perceived role was teaching home economics (49.1%), followed by supervising government programs (60.7%) and supervising staff and touring (67.0%).

Table 16. Distribution of agents according to their role perception

Role activities	Perception		
	Frequency	Percent	Rank
Providing farmers with information	95	84.8	2
Providing background information	81	72.3	8
Distributing farm materials	85	75.9	5
Writing reports	84	75.0	6[a]
Supervising government programs	68	60.7	11
Holding meetings, home and farm visits	99	88.4	1
Organizing community projects	92	82.1	3
Conducting demonstrations	84	75.0	6[a]
Supervising staff and touring	75	67.0	10
Planning programs and work calendar	86	76.8	4
Evaluating programs	79	70.5	9
Teaching home economics	55	49.1	12

[a]Two roles fall in the rank.

By classifying role perception scores into three categories, it was found that 8.0 percent of the agents had low scores, 49.1 percent had medium scores, and 42.9 percent had high scores (Table 17).

Table 17. Distribution of agents according to their role perception scores

Role perception score	Number of respondents	Percent	Cumulative percent
Low (1-4)	9	8.0	8.0
Medium (5-8)	55	49.1	57.1
High (9-12)	48	42.9	100.0
Total	112	100.0	

Role performance Role performance scores and rank orders are presented in Table 18. The scores ranged from 12 to 66. The role activity most performed by most extension agents was writing reports (58.9%), followed by providing farmers with information (56.3%) and distribution of farm materials (54.5%). The role activity least performed by the extension agents was teaching home economics (10.7%), followed by organizing community projects (41.1%) and conducting demonstrations (43.8%).

By classifying role perception scores into three groups, it was found that 31.3 percent of the agents had low scores, 44.6 percent had medium scores, and 24.1 percent had high scores (Table 19).

Table 18. Distribution of agents according to their role performance

Role activities	Performance		
	Frequency	Percent	Rank
Providing farmers with information	63	56.3	2
Providing background information	52	46.4	7[a]
Distributing farm materials	61	54.5	3
Writing reports	66	58.9	1
Supervising government programs	52	46.4	7[a]
Holding meetings, home and farm visits	56	50.0	4[a]
Organizing community projects	46	41.1	11
Conducting demonstrations	49	43.8	10
Supervising staff and touring	53	47.3	9
Planning programs and work calendar	57	50.9	6
Evaluating programs	56	50.0	4[a]
Teaching home economics	12	10.7	12

[a]Two roles fall in the rank.

Table 19. Distribution of agents according to their role performance scores

Role performance score	Number of respondents	Percent	Cumulative percent
Low (1-4)	35	31.3	31.3
Medium (5-8)	50	44.6	75.9
High (9-12)	27	24.1	100.0
Total	112	100.0	

Table 20 presents the rank ordering of the role perception and role performance scores from 1 to 12, with 1 representing the role activity with the highest score and 12 representing the role activity with the lowest score. The differential scores are the differences between the perception and the performance scores of each of the 12 role activities. The lowest differential score of 0 indicates that there was no discrepancy in the perception and the performance of the particular role activity, while the highest differential score of 8 shows a high degree of incongruity in the perception and the performance of the particular role activity. Thus, the perception and the performance of providing farmers with information and teaching home economics are most consistent, while the perception and the performance of organizing community projects are the most inconsistent.

The Spearman's rho (r_s) test of the correlation between the rankings of role perception activities and those of role performance was performed. The test revealed that the Spearman's rho coefficient (r_s=.42) was not significant at the .05 level. That is, the correlational relationship between the two rankings was positive but not statistically significant at this level.

Congruency between role perception and role performance, in terms of whether the perceived or not perceived roles were performed or not performed, was examined (Tables 21 and 22). Among the role activities that were perceived by extension agents (Table 21), the one with the highest congruency (i.e., perceived and performed by the largest number of extension agents) was providing farmers with information (42.8%), followed

Table 20. Rank orders of agent role perception and role performance

Role activities	Rank[a] Perception	Performance	Differential[b]
Providing farmers with information	2	2	0
Providing background information	8	7[c]	1
Distributing farm materials	5	3	2
Writing reports	6[c]	1	5
Supervising government programs	11	7[c]	4
Holding meetings, home and farm visits	1	4[c]	3
Organizing community projects	3	11	8
Conducting demonstrations	6[c]	10	4
Supervising staff and touring	10	9	1
Planning programs and work calendar	4	6	2
Evaluating programs	9	4[c]	5
Teaching home economics	12	12	0

[a]Spearman's rho (r_s) coefficient = .42, not significant at the .05 level.

[b]Differential shows the discrepancy in the role perception and role performance scores, indicating the degree of incongruity in the perception and performance of a role activity.

[c]Two roles fall in the rank.

by holding meetings, home and farm visits (42.0%), distributing farm materials (40.2%), evaluating programs (37.5%), and writing reports (36.6%).

Also, among the roles that were perceived by the agents, the one with the highest incongruency (i.e., perceived but not performed by the largest

number of extension agents) was organizing community projects (50.9%), followed by teaching home economics (46.4%), holding meetings, home and farm visits (46.4%), conducting demonstrations (45.5%), and planning programs and work calendar (43.8%).

Among the perceived roles, only two (providing farmers with information and distributing farm materials) were performed by more than half of the agents who perceived the roles. Thus, ten of the perceived roles were not performed by the majority of those who perceived the roles.

Table 22 shows that among the role activities that were not perceived by extension agents, the one with the highest incongruency (i.e., not perceived but performed by the largest number of extension agents) was supervising government programs (21.4%), followed by evaluating programs (18.8%), distributing farm materials (18.7%), planning programs and work calendar (17.0%), and supervising staff and touring (15.2%).

Also, among the roles that were not perceived by the agents, the one with the highest congruency (i.e., not perceived and not performed by the largest number of extension agents) was teaching home economics (42.9%), supervising government programs (17.9%), supervising staff and touring (17.8%), providing background information (13.4%), and writing reports (11.6%).

Among the roles not perceived, only two (teaching home economics and supervising staff and touring) were not perceived and not performed by the majority of those who did not perceive the roles. Thus, ten of the roles not perceived were performed by the majority of those who did not perceive the roles.

Table 21. Congruency and incongruency in the role activities perceived by extension agents

Role activities	Perceived		Congruency: Perceived and performed		Incongruency: Perceived but not performed	
	Number	Percent	Number	Percent	Number	Percent
Providing farmers with information	95	84.8	48	42.8	47	42.0
Providing background information	81	72.3	36	32.1	45	40.2
Distributing farm materials	85	75.9	45	40.2	40	35.7
Writing reports	84	75.0	41	36.6	43	38.4
Supervising government programs	68	60.7	28	25.0	40	35.7
Holding meetings, home and farm visits	99	88.4	47	42.0	52	46.4
Organizing community projects	92	82.1	35	31.2	57	50.9
Conducting demonstrations	84	75.0	33	29.5	51	45.5
Supervising staff and touring	75	67.0	35	31.3	40	35.7
Planning programs and work calendar	86	76.8	37	33.0	49	43.8
Evaluating programs	79	70.5	42	37.5	37	33.0
Teaching home economics	55	49.1	3	2.7	52	46.4

Table 22. Congruency and incongruency in the role activities not perceived by extension agents

Role activities	Not perceived		Incongruency: Not perceived but performed		Congruency: Not perceived and not performed	
	Number	Percent	Number	Percent	Number	Percent
Providing farmers with information	17	15.2	13	11.6	4	3.6
Providing background information	31	27.7	16	14.3	15	13.4
Distributing farm materials	27	24.1	21	18.7	6	5.4
Writing reports	28	25.0	15	13.4	13	11.6
Supervising government programs	44	39.3	24	21.4	20	17.9
Holding meetings, home and farm visits	13	11.6	9	8.0	4	3.6
Organizing community projects	20	17.8	11	9.8	9	8.0
Conducting demonstrations	28	25.0	16	14.3	12	10.7
Supervising staff and touring	37	33.0	17	15.2	20	17.8
Planning programs and work calendar	26	23.2	19	17.0	7	6.2
Evaluating programs	33	29.5	21	18.8	12	10.7
Teaching home economics	57	50.9	9	8.0	48	42.9

Role consensus Table 23 illustrates the nature of role consensus among agents on their role responsibilities. The first three activities on which there was consensus that they were of "very much importance" were: (1) providing farmers with information, (2) distributing farm materials, and (3) holding meetings and home and farm visits. Also, three items with the highest consensus scores as being of "no importance" were: (1) teaching home economics, (2) providing background information, and (3) supervising government programs.

The mean scores also show that role activities with the highest consensus scores were providing farmers with information ($\bar{X}$=4.4), distributing farm materials ($\bar{X}$=4.4), and holding meetings and home and farm visits ($\bar{X}$=4.4), while those activities with the lowest scores were teaching home economics ($\bar{X}$=3.0), writing reports ($\bar{X}$=3.7), providing background information ($\bar{X}$=3.8), supervising staff and touring ($\bar{X}$=3.8), and evaluating programs ($\bar{X}$=3.8) (Table 23).

By classifying role consensus scores into three categories, it was found that 17.0 percent had low scores, 42.8 percent had medium scores, and 40.2 percent had high scores (Table 24).

Tests of Hypotheses

The empirical tests of the proposed explanatory model of agent role impact are reported in this section. Using path analysis technique, the analysis involved a test of the full model, a decomposition of the effects among variables, and the formulation of a reduced model. The correlation matrix and regression coefficients of all the variables from the initial

Table 23. Distribution of extension agents according to their role consensus

Role activities	Role consensus: No importance Freq.	%	Little importance Freq.	%	Not little, not much importance Freq.	%	Much importance Freq.	%	Very much importance Freq.	%	Mean (score)
Providing farmers with information	6	5.4	2	1.8	4	3.6	25	22.3	75	67.0	4.4
Providing background information	9	8.0	7	6.3	15	13.4	44	39.3	37	33.0	3.8
Distributing farm materials	6	5.4	5	4.5	3	2.7	27	24.1	71	63.4	4.4
Writing reports	6	5.4	14	12.5	14	12.5	48	42.9	30	26.8	3.7
Supervising government programs	9	8.0	6	5.4	19	17.0	37	33.0	41	36.6	3.9
Holding meetings, home and farm visits	3	2.7	3	2.7	6	5.4	40	35.7	60	53.6	4.4
Organizing community projects	5	4.5	8	7.1	12	10.7	51	45.5	36	32.1	3.9
Conducting demonstrations	7	6.3	2	1.8	13	11.6	33	29.5	57	50.9	4.2
Supervising staff and touring	8	7.1	7	6.2	16	14.3	47	42.0	34	30.4	3.8
Planning programs and work calendar	3	2.7	8	7.1	10	8.9	43	38.4	48	42.9	4.1
Evaluating programs	8	7.1	14	12.5	9	8.0	44	39.3	37	33.0	3.8
Teaching home economics	29	25.9	14	12.5	18	16.1	33	29.5	18	16.1	3.0

Table 24. Distribution of agents according to their role consensus scores

Role consensus score	Number of respondents	Percent	Cumulative percent
Low (22-40)	19	17.0	17.0
Medium (41-50)	48	42.8	59.8
High (51-60)	45	40.2	100.0
Total	112	100.0	

tests of the hypothesized relationships that were developed in Chapter III are reported in Appendix B.

The Full Model

Role impact

It was hypothesized that role impact would be associated positively with role performance. This relationship was confirmed in the correlation analysis as well as in the simple linear regression. A path coefficient is equal to a zero-order correlation whenever a dependent variable is assumed to be determined by a single independent variable (Pedhazur, 1982). The regression analysis shows that as a single variable, role performance explained 4 percent of the variance in role impact (Table 25).

Role performance

It was hypothesized in the full model that role performance would be associated positively with age, education, training, job tenure, rank, job satisfaction, attitude, decision making, planning, personnel policies, role perception, and role consensus. Six of these hypotheses (age, rank,

Table 25. Correlation and regression analyses of the posited relationships

Dependent variable[a]	Independent variable[a]	Zero-order correlation (r)	Path coefficient (β)	Percent explained variance (R^2)
IMPACT (Y_4)	PERF (Y_3)	.21*	.21*	.04
PERF (Y_3)	AGE (X_1)	.25*	.25*	
	EDUC (X_2)	.08	-.13	
	TRAIN (X_3)	.12	-.01	
	TENURE (X_4)	.08	-.09	
	RANK (X_5)	.19*	.23*	
	JOBSAT (X_6)	.05	.06	
	ATT (X_7)	-.00	-.08	
	DMAKING (X_8)	.27*	.17*	
	PLANNIN (X_9)	.24*	.13	
	PERSONL (X_{10})	.04	-.13	
	PERC (Y_1)	.32*	.24*	
	CONS (Y_2)	.21*	.11	.26
CONS (Y_2)	AGE (X_1)	.03	-.12	
	EDUC (X_2)	.14	.09	
	TRAIN (X_3)	.06	-.02	
	TENURE (X_4)	.09	.01	

[a]The variables' names are listed on page 88.

*Relationship is statistically significant in the posited direction.

Table 25. Continued

Dependent variable[a]	Independent variable[a]	Zero-order correlation (r)	Path coefficient (β)	Percent explained variance (R^2)
	RANK (X_5)	.17*	-.03	
	JOBSAT (X_6)	.05	.05	
	ATT (X_7)	-.01	.06	
	DMAKING (X_8)	.17*	.08	
	PLANNIN (X_9)	.58*	.44*	
	PERSONL (X_{10})	.59*	.48*	
	PERC (Y1)	.21*	.14*	.59
PERC (Y_1)	AGE (X_1)	.04	-.07	
	EDUC (X_2)	.10	.01	
	TRAIN (X_3)	.18*	.20*	
	TENURE (X_4)	.04	-.07	
	RANK (X_5)	.10	.15	
	JOBSAT (X_6)	-.02	-.07	
	ATT (X_7)	-.07	-.08	
	DMAKING (X_8)	.23*	.23*	
	PLANNIN (X_9)	.10	.05	
	PERSONL (X_{10})	.04	-.01	.11

decision making, planning, role perception, and role consensus) were found to be related to role performance in the correlation analysis, while the other six (education, training, tenure, job satisfaction, attitude, and personnel policies) were found to be unrelated to role performance in the correlation analysis (Table 25).

For the posited causal paths from the 12 independent variables to role performance, only those from age, rank, decision making, and role perception were supported by the partial regression coefficients. These four paths attained the predicted positive beta coefficients (β's). The remaining paths (education, training, job tenure, job satisfaction, attitude, planning, and personnel policies) were not statistically significant (Table 25). The 12 independent variables in the full model collectively explained 26 percent of the variance in role performance (Table 25).

Role consensus

It was hypothesized that role consensus would be associated positively with age, education, training, job tenure, rank, job satisfaction, attitude, decision making, planning, personnel policies, and role perception. Five of these hypotheses (rank, decision making, planning, personnel policies, and role perception) were found to be related to role consensus in the correlation analysis, while the other six (age, education, training, job tenure, job satisfaction, and attitude toward farmers) were found to be unrelated to role consensus in the correlation analysis (Table 25).

Among the posited paths for the 11 independent variables to role consensus, only those from planning, personnel policies, and role perception were supported by the partial regression coefficients. That is, the test of partial regression coefficients shows that the contribution of each of these variables is significantly different from zero. Coefficients for the rest of the eight paths (age, education, training, job tenure, rank, job satisfaction, attitude, and decision making) were not statistically significant (Table 25). These insignificant paths were thus eliminated from the model. The 11 independent variables, operating jointly, explained 59 percent of the variance in role consensus (Table 25).

Role perception

It was hypothesized in the full model that role perception would be associated positively with age, education, training, job tenure, rank, job satisfaction, attitude, decision making, planning, and personnel policies. Only two of these relationships (training and decision making) were confirmed by the correlation analysis (Table 25).

The regression analysis of role perception produced similar findings to that of correlation analysis with regards to age, education, training, job tenure, rank, job satisfaction, attitude, decision making, planning, and personnel policies. Only two of the posited causal paths (training and decision making) were statistically significant. The unsupported paths were thus eliminated from the model. The ten independent variables taken together explained 11 percent of the variance in role perception (Table 25).

Decomposition of Effects

In path analysis, direct and indirect effects (influences) of a set of independent variables on given dependent variables can be tested through the decomposition of effects into their components using the procedures described by Alwin and Hauser (1981). Decomposition of effects for the significant paths in the full model was performed (Tables 26 and 27).

Significant paths for role performance

It was found that age had a strong direct effect on role performance. Its total effect (.2149) was less than its direct effect (.2448), because -14 percent of the total effect of age on role performance was mediated through role perception (-8%) and role consensus (-6%). Also, 14 percent of the total effect of rank on role performance was mediated through role perception (15%) and role consensus (-1%). The remaining 86 percent was the direct effect represented by the path coefficient (β). Again, 29 percent of the total effect of decision making on role performance was transmitted via role perception (25%) and role consensus (4%). The rest (71%) was direct effect on role performance as represented by the beta (β). Finally, 6 percent of the total effect of role perception on role performance was transmitted through role consensus and the remainder (94%) was unmediated by variables in the model.

Significant paths for role consensus

It was found that 2 percent of the effect of planning on role consensus was an indirect effect transmitted through role perception.

Table 26. Coefficients of variables in the reduced-form and structural equations of the full model

Predetermined variable		Equation and dependent variable (1) Y_1	(2) Y_2	(3) Y_2	(4) Y_3	(5) Y_3	(6) Y_3
AGE	(X_1)	-.0662	-.1310	-.1218	.2149	.2315	.2448
EDUC	(X_2)	.0048	.0917	.0910	-.1142	-.1153	-.1253
TRAIN	(X_3)	.1978	.0073	-.0201	.0370	-.0126	-.0104
TENURE	(X_4)	-.0669	.0033	.0126	-.1001	-.0833	-.0847
RANK	(X_5)	.1502	-.0117	-.0325	.2589	.2213	.2249
JOBSAT	(X_6)	-.0661	.0372	.0464	.0528	.0693	.0642
ATT	(X_7)	-.0787	.0479	.0588	-.0918	-.0721	-.0785
DMAKING	(X_8)	.2281	.1079	.0763	.2304	.1733	.1649
PLANNIN	(X_9)	.0497	.4501	.4433	.1955	.1830	.1344
PERSONL	(X_{10})	-.0124	.4816	.4833	-.0815	-.0784	-.1315
PERC	(Y_1)			.1385		.2504	.2352
CONS	(Y_2)						.1098
F		1.231	13.540***	13.074***	2.519***	3.120***	2.905***
R^2		.109	.573	.590	.200	.256	.260

***Significant at .01.

Table 27. Direct and indirect effects of dependent variables in the full model

Dependent variable	Predetermined variable		Total effect	Indirect effect via Y_1	Indirect effect via Y_2	Direct effect (β)
PERF (Y_3)	AGE	(X_1)	.2149	-.0166	-.0133	.2448
	EDUC	(X_2)	-.1142	.0011	.0100	-.1253
	TRAIN	(X_3)	.0370	.0496	-.0022	-.0104
	TENURE	(X_4)	-.1001	-.0168	.0014	-.0847
	RANK	(X_5)	.2589	.0376	-.0036	.2249
	JOBSAT	(X_6)	.0528	-.0165	.0051	.0642
	ATT	(X_7)	-.0918	-.0197	.0064	-.0785
	DMAKING	(X_8)	.2304	.0571	.0084	.1649
	PLANNIN	(X_9)	.1955	.0125	.0486	.1344
	PERSONL	(X_{10})	-.0815	-.0031	.0531	-.1315
	PERC	(Y_1)	.2504	--	.0152	.2352
	CONS	(Y_2)	.1098	--	--	.1098
CONS (Y2)	AGE	(X_1)	-.1310	-.0092	--	-.1218
	EDUC	(X_2)	.0917	.0007	--	.0910
	TRAIN	(X_3)	.0073	.0274	--	-.0201
	TENURE	(X_4)	.0033	-.0093	--	.0126
	RANK	(X_5)	-.0117	.0208	--	-.0325
	JOBSAT	(X_6)	.0372	-.0092	--	.0464
	ATT	(X_7)	.0479	-.0109	--	.0588
	DMAKING	(X_8)	.1079	.0316	--	.0763
	PLANNIN	(X_9)	.4501	.0068	--	.4433

Table 27. Continued

Dependent variable	Predetermined variable	Total effect	Indirect effect via Y_1	Indirect effect via Y_2	Direct effect (β)
	PERSONL (X_{10})	.4816	-.0017	--	.4833
	PERC (Y_1)	.1385	--	--	.1385
PERC (Y_1)	AGE (X_1)	-.0662	--	--	-.0662
	EDUC (X_2)	.0048	--	--	.0048
	TRAIN (X_3)	.1978	--	--	.1978
	TENURE (X_4)	-.0669	--	--	-.0669
	RANK (X_5)	.1502	--	--	.1502
	JOBSAT (X_6)	-.0661	--	--	-.0661
	ATT (X_7)	-.0787	--	--	-.0787
	DMAKING (X_8)	.2281	--	--	.2281
	PLANNIN (X_9)	.0497	--	--	.0497
	PERSONL (X_{10})	-.0124	--	--	-.0124

The rest (98%) was direct influence on role consensus. Also, personnel policies had a strong direct effect on role consensus. Its total effect of .4816 and its direct effect of .4833 show that there was little or no indirect effect of personnel policies on role consensus via role perception. Finally, it was found that role perception had no indirect effects on role consensus because of the absence of intervening variables. Thus, its total effect equaled its direct effect as represented by the path coefficient (β).

Significant paths for role perception

Training and decision making had no indirect effects on role perception because of the absence of intervening variables. Their total effects thus equaled their direct effects as represented by the path coefficients (β's).

The Reduced Model

The reduced model was obtained after eliminating the posited paths in the full model which were statistically not supported (Figure 3). In the reduced model, there are eight significant paths. The arrows pointing in one direction show the standardized partial regression coefficients (path coefficients, β's) which were obtained by solving the regression equations in the full model. The standardized partial regression coefficients represent the expected change in the dependent variable, in standard scores, associated with a change of one standard deviation in an independent variable, while holding the rest of the variables constant. Thus, these coefficients (or betas) identify the strength and direction of

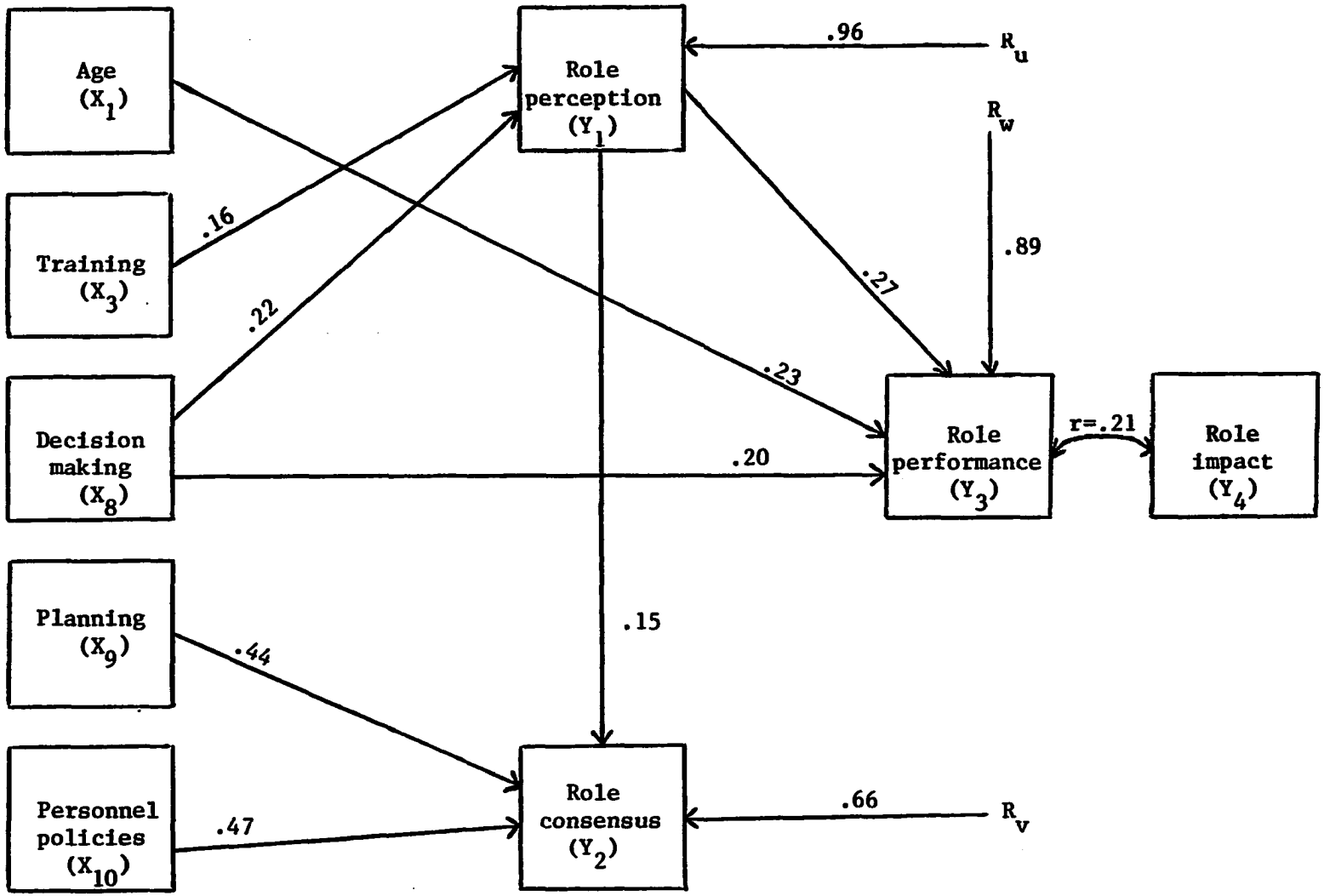


Figure 3. The reduced model (variable names are on page 88)

each relationship. The coefficients are scale-free. Therefore, they can be compared among variables.

Role perception was found to be the most important independent variable for predicting role performance (β=.27), followed by age (β=.23), and decision making (β=.20) (Figure 3).

The most important predictor of role consensus was found to be personnel policies (β=.47), followed by planning (β=.44) and role perception (β=.15) (Figure 3). Finally, the most important independent variable for predicting role perception was decision making (β=.22), followed by training (β=.16) (Figure 3).

The unidirectional arrows joining the error terms or residuals (R_i's) to the dependent variables in the reduced model (Figure 3) are the residual path coefficients obtained by calculating the square root of the unexplained variance ($I-R^2$) for each dependent variable, after solving the regression equation in the full model. Noncausal relationships among the exogenous variables are not represented by the usual double-headed curved arrows and their zero-order correlations. These correlations have been omitted from the path diagrams to simplify the presentations. The zero-order correlation matrix of all the variables is given in Appendix B. The highest correlations between any two exogenous variables were .704 and .593; most were below .20. With correlations this low, multicollinearity does not appear to be a problem. The threshold level for multicollinearity of bivariate correlation between any two exogenous variables is r=.8 (Nie et al., 1975). Finally, in the diagram of the reduced model, education, job tenure, rank, job satisfaction, and attitude

were excluded from the analysis because they did not show significant paths to any of the dependent variables. Rank was initially significantly related with role performance in the full model, but as the systematic elimination of nonsignificant paths progressed, it lost its significance and place in the reduced model.

Summary of hypotheses

In terms of the hypotheses stated in Chapter III, empirical analysis provides support for the following eight hypotheses.

2.1. Age of the extension agent is related positively to role performance.

2.8. Agent perception of the decision making of the extension organization is related positively to role performance.

2.11. Role perception of the extension agent is related positively to role performance.

3.9. Agent perception of planning in the extension organization is related positively to role consensus.

3.10. Agent perception of personnel policies in the extension organization is related positively to role consensus.

3.11. Role perception of the extension agent is related positively to role consensus.

4.3. Training of the extension agent is related positively to role perception.

4.8. Agent perception of decision making of the extension organization is related positively to role perception.

CHAPTER VI. DISCUSSION

The purpose of this chapter is to summarize and discuss the research conducted and reported in this dissertation. The extent to which the three major objectives of the study were achieved is assessed. In addition, the theoretical, research, and policy implications of the findings are discussed.

Overview of Research

The impetus for this study was generated, on the one hand, by the overwhelming recognition of the critical importance of agricultural extension and, on the other hand, by the common notion that agricultural extension is grossly ineffective in developing countries including Nigeria. The study focuses on the role and impact of the extension agents in Kaduna State of Nigeria and examines the factors which are important for their role performance and the relationship between role performance and perceived role impact.

The dissertation has both applied and theoretical aspects. At the applied level, extension agent role and impinging factors are evaluated as an intervention strategy for better understanding of some of the problems and challenges faced by agents and for improving the agents' effectiveness. Policies and programs designed with regard to the findings of this research in terms of manipulation and prioritization of important variables should improve agents' performance and impact.

At the theoretical level, the study developed and tested an exploratory/heuristic model of agent role performance and impact. The

model was tested to clarify the causal factors which lead to role performance and, ultimately, to role impact or perception of role impact.

The data for the study were obtained primarily with a survey questionnaire which was administered to extension agents by enumerators through personal interviews. The number of extension agents interviewed was 112 from a total of 115 in the selected area. Descriptive statistics were used for basic characteristics of the extension agents. Multiple regression and path analysis procedures were used to examine the hypothesized causal linkages in the theoretical model.

Results

The study has three objectives: (1) to assess the perceived impact of extension agents on agriculture and rural life, (2) to examine the role perception, role performance, and role consensus of extension agents, and (3) to develop and test the importance of a set of variables posited or presumed as explaining differential agent role performance and the bivariate relationship between role performance and perceived role impact.

Objective 1

The first objective was to evaluate the impact of the role of extension agents in agriculture and rural life. Five of the 17 aspects of agricultural and rural development which were perceived to have been least impacted by the role activities of extension agents as determined by frequency means are, starting from the least impacted: (1) availability of loans/credit, (2) reduction in rural-urban migration, (3) better home management, (4) elimination of rural poverty, (5) better knowledge of

marketing processes and self-help projects. It should be noted that all of these five items owe their impact to several other rural development services other than agricultural extension. These include rural banking, rural industrial development, marketing boards, rural health, and community development. State policies within which these services are bounded are also important determinants of agents' impacts. Furthermore, there seems to be relatively low congruency between some of the role activities of extension agents and some of the selected expected impacts. Thus, impacts would largely be indirect, rather than direct, effects of agents' role activities in these cases. For example, providing farmers with information on improved agricultural storage and marketing practices may indirectly lead to higher farm family incomes through widespread adoption of the improved practices.

Five aspects perceived to have been greatly impacted, starting with one that experienced the most impact are: (1) widespread awareness of recommended farm practices, (2) availability of farm inputs, (3) higher crop production, (4) larger farm sizes, and (5) favorable attitude toward farming. It should be noted that while agents perceive very much impact on widespread awareness of recommended farm practices, they perceive only moderate impact on widespread adoption of these farm practices. Thus, there seems to be a considerable time lag between awareness and adoption of farm innovations.

By their perceptions, even extension agents themselves did not seem to consider their roles as having great impact. Ten percent of the agents had low perception of their role impact, while 8 percent had high

perception of their role impact. The bulk of the agents (82 percent) had medium perception scores. Most of the agents considered most of the impacts of extension activities on agricultural and rural development as "Not little, not much."

Objective 2

The second objective was to examine the role of extension agents in its three dimensions: role perception, role performance, and role consensus. Five most important roles by agents' perception were, in descending order of importance: (1) holding meetings, home and farm visits, (2) providing farmers with information, (3) organizing community projects, (4) plahning programs and work calendar, and (5) distributing farm materials. Perception of organizing community projects as the third most important role was an unexpected finding, because it is neither a visible nor a much discussed activity on the Nigerian extension scene. This activity is frequently considered the responsibility of the community development service unit of the department of local government and community development. Perhaps it is an indication of a new direction of thinking in extension pertaining to the need for agricultural type community projects like farmers' clubs, group farming, cooperatives, farming systems, and training and visit extension model, in which the community becomes involved.

Distribution of farm materials also attained a surprising position as the fifth most important role in agents' perception, considering repeated expert recommendations that extension agents should work out of this role and concentrate on specifically educational roles (Williams, 1980). It

may well be that this role is seen to be as important as any educational role to the peasant farmers considering their socioeconomic situation and the conspicuous absence of well-developed commercial agricultural input distribution services (Atala, 1981). To provide exciting information to farmers about new farm practices without making farm materials available would simply generate frustration in their effort to improve their productivity.

Five least perceived roles by the agents were, starting from the least important: (1) teaching home economics, (2) supervising government programs, (3) supervising staff and touring, (4) evaluating programs, and (5) providing background information.

In terms of the scores on the number of activities agents perceived as the responsibilities of extension agents, few agents (8%) perceived less than five of the 12 listed activities, while as many as 43 percent of the agents had high perception scores of between nine and 12 activities. Nearly a majority (49%) perceived between five to eight role activities. In general, agents perceived many of the listed activities as the responsibilities of extension agents.

Data on role performance showed that the five most performed role activities of extension agents were (1) writing reports, (2) providing farmers with information, (3) distribution of farm materials, (4) holding meetings, home and farm visits, and (5) evaluating programs. An interesting finding is that writing reports was number one in the most performed activities. This indicated that perhaps much time is spent on paperwork, most likely at the expense of actual contact with the farmers.

Distribution of farm material ranked third as one of the most performed activities, suggesting the importance of this role in the Nigerian agricultural extension.

Five of the least performed roles were (1) teaching home economics, (2) organizing community projects, (3) conducting demonstrations, (4) holding meetings, home and farm visits, and (5) evaluating programs. It is noteworthy that even though holding meetings, home and farm visits ranked first as the most perceived role, it was among four of the least performed activities of the extension agents. Also, organizing community projects ranked third among the most perceived roles, but was second to the least performed activity. These suggest that there are discrepancies between role perceptions and role performance or even a lack of congruency between theory and practice. Again, conducting demonstrations, which is considered a high credibility technique for disseminating information, was the third least performed activity, indicating that perhaps the most effective extension techniques are not pursued or emphasized.

In terms of the scores on the number of expected role activities performed by agents, nearly one-third (31.3%) of the agents performed less than five of the 12 listed role activities, 44.6 percent performed between five to eight roles, and 24.1 percent performed nine or more activities. Generally, the agents performed a moderate number of role activities.

Rank score differentials in the perception and performance of agents' responsibilities served as pointers to existing inconsistencies between role perception and actual role performance. There was no discrepancy in the perception and performance ranking scores for (1) providing farmers

with information and (2) teaching home economics. In the first case, the two rank scores were consistently second to the highest, whereas in the second case, they were consistently the lowest. Thus, providing farmers with information was perceived as an important role and equally performed by the extension agents, while teaching home economics was perceived as an unimportant role and equally performed by the agents. Providing background information and supervising staff and touring were also consistently ranked low. The greatest gaps between perception and performance rankings were for (1) organizing community projects and (2) writing reports and (3) evaluating programs. In these cases, organizing community projects had a high perception and a low performance ranking; writing reports had a low perception and a high performance ranking; and evaluating programs had a low perception and a high performance ranking. However, the rank order correlation analysis (Spearman's rho) performed to determine statistical correspondence of the ranks revealed a positive but nonsignificant correspondence; thus, indicating, for example, that the highest ranked perceived role activity was not necessarily the highest ranked performed activity, and vice versa.

An examination of the congruency between role perception and role performance revealed that, among those who perceived the roles, the majority did not frequently perform them (except in the case of providing farmers with information and distributing farm materials). In other words, perception of many roles was no assurance that they would actually be performed. This suggests that a major reason that extension has not made significant impacts may be because many of the expected roles are not

frequently performed by the majority of the agents. Major reasons for this might be the lack of resources and incentives for carrying out the roles or simply that many of the agents are "derelict in duty."

However, among those who did not perceive certain roles, the majority of them frequently did, rather than did not, perform the roles (except in the case of teaching home economics and supervising staff and touring). The reason for this occurrence might be that even though the agents might differ with officials in their perception of the roles of extension agents, they have to perform those roles assigned to them or expected of them. Also, a few of the agents were found who did not perceive and did not perform the roles. They may be those who are privileged or happened not to be doing what they do not perceive to be their roles.

Findings on role consensus show that the first five role activities considered by most agents as being of "Very much importance" were (1) providing farmers with information, (2) distributing farm materials, (3) holding meetings, home and farm visits, (4) conducting demonstrations, and (5) planning programs and work calendar. It should be pointed out that these roles encompass educational, supply, and administrative roles. Five roles considered as being of "No importance" by most agents were (1) teaching home economics, (2) providing background information or statistics, (3) supervising government programs, (4) supervising staff and touring, and (5) evaluating programs. Teaching home economics received the highest consensus as being of no importance, probably due to the absence of women extension agents in the sample population and general neglect of post-harvest technology. It appears, then, that sex might be

an important factor in the agents' perception and performance of their roles as well as in their role consensus with officials. Therefore, sex should be taken into account in extension staff recruitment. Another consideration is that home economics generally comes under the health and social welfare department rather than the department of agriculture.

The mean scores, however, show that role activities with the highest consensus were (1) providing farmers with information, (2) distributing farm materials, and (3) holding meetings, home and farm visits; while those with the lowest consensus were (1) teaching home economics, (2) writing reports, and (3) providing background information, supervising staff and touring, and evaluating programs (bracketed). Low consensus on teaching home economics might be due primarily to the absence of women agents, who are the ones usually associated with this role. In the case of writing reports, providing background information, evaluating programs, and supervising staff and touring, low consensus could be due to agents' low perception of their relevance or resentment of too much paperwork and excessive, lack of, or ineffective supervision.

In terms of the overall scope and extent to which the agents were on agreement with officials on extension roles, few of the agents (17%) were low in role consensus, while 43 percent were moderate and 40 percent were high. In general, there was a relatively high role consensus on agents' roles.

Objective 3

A third objective was to develop and test the factors posited or expected as explaining differential agent role performance as well as the

relationship between role performance and role impact. In this respect, a set of variables having probable importance for role performance and role impact was identified and 34 hypotheses about the relationships among these variables were formulated for testing. Role and organization theories were used as a framework for investigating factors that contribute to role performance and the relationship between role performance and role impact. Drawing upon these theories and other rationales, it was hypothesized or presumed that agent personal characteristics, organizational factors, role perception, and role consensus determine role performance which, in turn, influences role impact.

Pearsonian bivariate correlation analysis showed that 41 percent of these hypotheses were confirmed by the empirical data. However, when data were subjected to regression analysis, with the influence of other factors being statistically controlled, 27 percent of the hypotheses were confirmed.

Correlation analysis revealed that there is a significant relationship between role performance (number of roles performed) and role impact (number of perceived impacts). Simple regression analysis of this relationship showed that role performance explained as much as 4 percent of variance in role impact. These findings suggest that agents' performance of their role activities is important for agricultural and rural development. The wide scope of items that formed the role impact scale could be the primary reason for the relatively low explained variance in role impact.

Significant predictors of role performance as revealed in the reduced regression model were role perception, age, and decision making. Agents who perceive more extension roles, agents who are older, and agents who perceive a greater degree of participation in decision making are more likely to have greater role performance or to perform most of the role activities of extension agents. The beta for the role perception predictor was the strongest predictor for role performance. Agents who perceive many roles would tend to perform many of them. Older agents would tend to have longer service tenure, greater experience, more in-service training, greater commitment, and would tend to be occupying high ranks involving wider varieties of responsibilities than younger agents. And, agents who perceive a greater degree of participation in the decision making of the extension organization are likely to have been adequately involved in the decision making processes and to have become aware of a wide variety of the role expectations for extension agents.

The path analysis served to identify the characteristics of those who had performed most of the roles of extension agents. Those who had high role performance were associated positively with greater role perception, older age, and greater perception of participation in decision making. Those with greater role perception were, in turn, associated positively with greater perception of participation in decision making and more in-service training. Those with greater role consensus were also associated positively with greater perception of personnel policies of the extension agency, greater perception of planning in the agency, and perception of greater number of roles.

There were only three significant partial regression coefficients between the independent variables and the central variable in the model of role performance. The effects of two of the variables (role perception and age) were channeled directly to role performance and the effect of the other one (decision making) was channeled both directly and indirectly to role performance. Although none of the two intervening variables was deleted in the reduced model, the path from role consensus to role performance was not statistically significant. The reason might be that even though extension agents tend to agree with officials on extension roles, they are constrained by inadequate resources and incentives for carrying out the roles.

Finally, it was revealed that education, job tenure, rank, job satisfaction, and attitude were not significantly important in this study for explaining any of the three dependent variables in the model as predicted. In the situation of the Nigerian agricultural extension, where there is considerable latitude and general laxity in the performance of roles, it is possible that the effects of these factors on role perception, role performance, and role consensus, as defined in this study, were moderated by the personal orientations, circumstances, experiences, ideosyncracies, and even habits of the agents.

Besides, substantial numbers of extension agents were found to be low in many of the personal characteristics studied, especially age, education, training, job tenure, rank, and attitude, suggesting that they did not have the required attributes for role perception, role performance, and role consensus.

It is also likely that limited resources, which characterizes extension services in Nigeria, hampers the development and promotion of programs that would further enhance the agents' understanding and performance of extension roles in addition to what personal agent characteristics such as education and job tenure might provide. These explanations might apply also to all of those variables that survived in the model, in cases where they were not significantly important for predicting any one or two of the dependent variables. These include age, training, decision making, planning, personnel policies, and role consensus.

The bivariate correlation analysis revealed that none of the correlations between any two exogenous variables was at or above the threshold level ($r=.8$) for multicollinearity (Nie et al., 1975). However, sizeable correlations were found among some of the exogenous variables, especially age and rank. These relationships may have reduced the values of the partial regression coefficients in the full model and led to elimination of many of the hypothesized paths. The greater the intercorrelations of the independent variables, the less the reliability of the relative importance indicated by the partial regression coefficients (Nie et al., 1975).

In future research, the multicollinearity problem could be prevented by taking certain measures. One solution would be to combine highly intercorrelated variables into composite scales rather than use them as single predictors. For instance, reliability of the partial regression coefficients could have improved by employing a composite scale for

socioeconomic position containing age, education, training, tenure, and rank. Also, since high intercorrelations suggest dependence of some variables on others, one measure to counter multicollinearity is to analyze patterns of causality among exogenous variables. Example: rank may be dependent on education, training, and tenure.

Another reason for nonsignificant path coefficients in this study could be measurement errors. According to Pedhazur (1982), measurement errors in the dependent variables lead to a downward bias in the estimation of betas and measurement errors in the independent variables lead to either an upward or a downward bias in betas.

Except for role consensus, the percentage explained variance, R^2, which indicates the overall accuracy of the prediction, was low for the rest of the dependent variables in the full causal model. This means that most of their variances remained unexplained. The explained variance for role consensus was 59 percent,.followed by role performance (26%) and role perception (11%). Errors of measurement are largely responsible for the disappointingly low R^2 values that are obtained in much of the research in the social sciences (Pedhazur, 1982). However, it seems probable that in this study, the low R^2's are also due to specification error (i.e., exclusion of the relevant variables). For example, environmental factors such as government policies, financial resources, and client characteristics such as farmers' education, farm size, social participation, and attitude would seem important for agent role perception and role performance and, therefore, should be included in the study of agent role impact. More rigorous measurement of some of the variables

could improve the R^2's in this study, especially those variables that were not measured strictly at the interval level.

Implications

This study has theoretical, research, and policy implications. At the theoretical level, an agent role performance and role impact model was developed and tested. Some of the variables and their posited relationships were empirically upheld, as they were found to be statistically important for explaining role performance which, in turn, was significantly associated with role impact. Other variables, however, were eliminated from the initial model. There were also relatively low R-squared values. These may be indications of specification error. Thus, more relevant variables need to be included in the model. Nonetheless, a stage for the formulation of a powerful model of agent role performance and role impact has been set in this investigation. One tentative contribution this study has made to the understanding of the study problem is to demonstrate that the effectiveness of extension agents depends on personal, organizational, and perceptual factors. These factors are considered important in role and organization theories which were used to form the theoretical framework for the present study. Other theories, such as motivation theories, might also make significant contributions.

At the research level, it was found in this study that some variables were not important to the dependent variables as hypothesized, and the explained variances, or the overall accuracy of the predictions, of two dependent variables were low. In future research, better selection and

measures of variables would be required. The variables should also be tested for multicollinearity in order to obtain more reliable results.

The study examined the role perception of extension agents, the degree to which there is consensus with officials as to the importance of such roles and the role activities performed by extension agents. However, it is not quite known under what conditions the role activities are perceived, agreed upon, and performed. Further research is needed to investigate the reasons for not perceiving, not agreeing with officials, and not performing some of the role activities of the extension agents.

Future research should also consider the contribution of the environment in which the agent operates. Relevant environmental factors should include farmers' socioeconomic characteristics and their physical or infrastructural environment as well as the macro-level factors such as relevant state policies, programs, and commitment.

Furthermore, subjectivity might be seen as a limitation of this study in the sense that much of the data were information gathered from the extension agents themselves. However, several measures were taken to reduce the degree of subjectivity, including pretesting of the instrument and explanation of confidentiality of the data to the respondents. One of the strengths of perception research is that it provides opportunity to know what and how respondents feel about issues. It represents their subjective interpretations of the world around them and how they react to it (Parkes, 1971). This study reveals to some extent how extension agents feel about their organization, their roles, their role performance, and their impact. It is suggested, nonetheless, that future research should

evaluate the roles of extension agents from both agent and farmer levels by employing the same evaluation criteria for both groups. This way, agents' responses could be compared against farmers' responses; thereby, any biases from the agents would be exposed or counterbalanced by the information from the farmers, who are the ultimate consumers of extension work and who should be the final judges of agents' effectiveness.

Finally, at the policy level, this study brings to light certain implications and problems which should be considered in agricultural extension policy or program implementation. By using causal (path) analysis, the study revealed several factors which are important for agent role performance, which is, in turn, important for agent role impact. Agent role perception, age of the agent, and perception of decision making in the organization were the critical factors in agents' role performance. A strategy for policy makers might be to manipulate these factors to increase agent role performance and impact. In this case, the role expectations of extension agents should be inculcated into the minds of the agents through training programs and practical experience. Opportunities that older agents might have in the extension organization, such as experience, training, job advancement, job security, and job commitment, should be created for younger agents, too. And, participation in the decision making processes of the extension organization by its members and its clients should be encouraged.

The present study also demonstrated that the contribution of extension alone cannot bring about significant agricultural and rural development. To increase its impact, extension should be conceived within

the framework of a comprehensive agricultural and rural development policy. Thus, any agenda to increase the impact of extension agents should involve the design and implementation of integrated agricultural and rural development policies and programs. However, in order for extension to contribute its quota sufficiently to agriculture and rural development, the following actions must be purposefully and committedly taken:

1. Formulate a clear, concise, consistent, and comprehensive national and state extension policy with strong commitment for the implementation of the programs. Such a policy should aim at achieving mass awareness and adoption of new agricultural farm, storage, and nutritional technologies.
2. Effective coordination of extension programs and their integration into a comprehensive national and state agricultural and rural development policy and programs for the accomplishment of the desired rural development goals.
3. Determine appropriate extension technologies and their effectiveness for the small farmers, the availability, and the potential for adoption by the farmers.
4. Determine the specific characteristics of the target groups, establish or utilize appropriate rural community institutions, and provide sufficient incentives and appropriate education to the clientele.

5. Provide sufficient resources, incentives, and training for the extension agents who are basically discouraged and frustrated workers by comparison to workers in other government agencies.
6. Recruit women into agricultural extension positions.

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APPENDIX A.

QUESTIONNAIRE

A STUDY OF THE ROLE OF THE EXTENSION AGENT IN KADUNA STATE

DEPARTMENT OF AGRICULTURAL ECONOMICS AND RURAL SOCIOLOGY
INSTITUTE FOR AGRICULTURAL RESEARCH
AHMADU BELLO UNIVERSITY
SAMARU, ZARIA

Agent Questionnaire

Name of Respondent _____

Enumerator _____

Date _____

INTRODUCTION

The major purpose of this study is to obtain information on the activities of Extension workers with a view to understand and explain better, the successes and failures of Extension organization in providing services to farmers. The information to be collected from you is expected to be used for improving the job performance of Extension workers which, in turn, would improve farmers' productivity and welfare and also contribute toward the success of the current Green Revolution program in Nigeria. We shall, therefore, appreciate your cooperation in providing answers to our questions about Extension in Kaduna State.

We assure you that none of the information you give us will be published or released in any way which would identify you as the source. Thank you.

Appendix A: Agent Questionnaire

Perception and Performance

1. The following activities are for the improvement of agriculture and welfare of the rural people. Could you please:

   a. Mark (✓) against the activities that should be the responsibilities of Extension workers only.

   b. Mark (✓) against the activities which you have performed since one year ago.

Activities	Mark (✓)(1) against activities which should be the responsibilities of Extension workers	Mark (✓)(2) against activities which you performed since one year ago
1. Providing farmers with information on improved farm practices, storage, marketing and credit.	_____	_____
2. Providing background information and data on agriculture to officials and researchers.	_____	_____
3. Distributing or selling farm materials such as fertilizer, seeds, pesticides and tractors.	_____	_____
4. Writing reports and correspondences and attending meetings with other civil servants.	_____	_____
5. Supervising government production programs/projects (e.g., IADP, NAFPR, GR and RBDA).	_____	_____
6. Holding group meetings and making home and farm visits to discuss farm problems with farmers.	_____	_____
7. Initiating or organizing community projects, cooperative groups, farmers' clubs, and training local leaders.	_____	_____
8. Conducting method and result demonstrations.	_____	_____
9. Supervising junior agricultural staff and touring.	_____	_____
10. Planning Extension programs and developing calendar of work.	_____	_____
11. Evaluating Extension programs by discussing with colleagues and junior and senior officers.	_____	_____
12. Teaching home economics to village women.	_____	_____
13. Other (specify).	_____	_____

3. Would you please rate the importance of each of these activities to Extension.

Activities	Of no importance at all	Of little importance	Not little not much importance	Of much importance	Of very much importance
1. Providing farmers with information on improved farm practices, storage, marketing and credit.					
2. Providing background information and data on agriculture to officials and researchers.					
3. Distributing or selling farm materials such as fertilizer, seeds, pesticides, and tractors.					
4. Writing reports and correspondences and attending meetings with other civil servants.					
5. Supervising government production programs/projects (e.g., IADP, NAFPP, GR and RBDA).					
6. Holding group meetings and making home and farm visits to discuss farm problems with farmers.					
7. Initating or organizing community projects, cooperative groups, farmers' clubs, and training local leaders.					
8. Conducting method and result demonstrations.					
9. Supervising junior agricultural staff and touring.					
10. Planning Extension programs and developing Calendar of work					
11. Evaluating Ext. programs by discussing with colleagues and Junior and Senior Officers.					
12. Teaching home economics to village women.					
13. Other (specify).					

4. Activities of Extension workers can be categorized into five major roles as listed below. Would you please rank these roles according to their importance in Extension (i.e., write 1st, 2nd, 3rd, 4th and 5th against these roles):

Major Role	Rank
Educational activities	.....
Administrative activities	.....
Supply activities	.....
Collective of agricultural data	.....
Routine visits and field observations	.....

5. Which of these roles do you mostly engage in?

Education activities

Administrative activities

Supply activities

Collection of agri-
cultural data

Routine visits and field
observations

6. How much time do you spend on these roles?

Roles	No time at all	Little time	Not much time; Not little time	Much time	Very much time
1. Educational activities.					
2. Administrative activities.					
3. Supply activities.					
4. Collection of agricultural data.					
5. Routine visits and field observations.					

7. Extension is one of the oldest approaches to agricultural and rural development in Nigeria. So far how much do you think that the activities performed by Extension agents have led to the following results?

Results	Nil	Little	Not little; Not much	Much	Very much
1. Widespread awareness of recommended farm practices.					
2. Widespread adoption (use) of recommended farm practices.					
3. Availability of farm inputs such as fertilizer, seeds, pesticides, etc.					
4. Availability of loans and credit facilities.					
5. Higher crop production (yield) per/hectare.					
6. Higher livestock production.					
7. Bigger farm sizes.					
8. Better knowledge of marketing and pricing processes.					
9. Higher family incomes.					
10. Organization of more and better youth clubs.					
11. Better knowledge and use of recommended home management activities by rural women.					
12. Organization of farmers into cooperatives.					
13. A more favorable attitude toward farming and rural life.					
14. More social services such as health, education and recreation.					
15. Problem solving or self-help projects.					
16. Reduction in rural-to-urban migration.					
17. Elimination of rural poverty.					
18. Other (specify).					

Socio-demographic Characteristics

8. What is your age? .....

9. Where were you born? Town/Village ..... LGA .....

10. What ethnic group are you a member of? .....

11. Where are you currently working? Town/Village .....

12. Are you: 1) Married ..... or 2) Single .....

13. If married, how many wives and children do you have?

    No. of Wives ..... No. of Children .....

14. How many other dependants are living with you? .....

15. What is the total number of people living with you? .....

16. What is your father's major occupation? .....

17. What is your mother's major occupation? .....

18.

Type/Level	Years	Qualification Obtained
Primary School		
Secondary School		
Teachers' College		
School of Agriculture		
University		
Others (specify)		

19. Did you attend Koranic School? ..... For how long? .....

20. Did you attend Adult Education class? ..... For how long? .....

21. What other education or training have you had? .....

.....

22. How would you classify yourself as a student in school?

    1. Considerably above average .....
    2. Somewhat above average .....
    3. Average .....
    4. Below average .....
    5. Poor .....

23. For how long have you been on this job?.....

24. At what rank (official title) did you enter this job? .....
    .....

25. What was your qualification then? .....

26. Would you say that when you started on this job you have the necessary ability (i.e., technical skill), for the job that was assigned to you?

    1. YES..... 2. NO.....

27. What is your present rank (official title)? .....

28. Do you consider your ability (technical skill) adequate for your present rank?

    1. Very adequate .....
    2. Somewhat adequate .....
    3. Inadequate .....
    4. Very inadequate .....

29. Did you work somewhere else before taking up Extension work?.....

30. If yes, who was your employer?.....

    Where did you work for him? .....

    How many years did you work for him? .....

    What type of work did you do?.....

31. How much influence did the following people/conditions have on your decision to take up your present job as an Extension Staff?

People/Conditions	No influence	Some influence	A great deal of influence
1. Father			
2. Mother			
3. Other relatives			
4. Friends			
5. Poor conditions of work at my previous place of work			
6. The nature of my training			
7. Lack of a better alternative			
8. Other (specify)			

32. Please indicate your satisfaction with your job with respect to the following:

	Dis-satisfied	Somewhat satisfied	Very satisfied
1. Salary			
2. Opportunity for promotion			
3. Fringe benefits			
4. Facilities for doing the job			
5. Respect which others have for your job			
6. Communication with your supervisor			
7. Communication with farmers			

33. What job would you like to have five years from now? .....

.....

34. In what field (subject) would you like to further your education (Agriculture, Education, Health, etc.)? .....
.....

35. Is Extension work interesting and challenging to you?

1. YES ..... 2. NO .....

36. Would you recommend this job to your brother or friend?

1. YES ..... 2. NO .....

37. If you were to start all over, would you still choose Extension as a career?

1. YES ..... 2. NO .....

Organizational Characteristics

(Structure, Administration & Personnel Policies)

38. Who do you work for?
    1. Local Government .....
    2. Integrated Rural Deve. Authority (IRDA).....
    3. Kaduna State Government.....
    4. Other (specify).....

39. In which of the following Extension units do you belong?
    1. General Extension .....
    2. Horticulture .....
    3. Crop Protection
    4. Seed Multiplication
    5. Livestock (Veterinary Extension)
    6. Home Economics
    7. Other (specify)

40. The Agricultural Instructor (Village Level Extension Agent) seems to be the one directly involved with the farmer, do you think that he has the necessary ability (skill) for effective performance of the work he is expected to do?

1. YES ..... 2. NO .....

41. Are farmers' organizations officially involved in Extension?

1. YES ..... 2. NO .....

42. Are farmers being organized into cooperatives for Extension work purpose?

1. YES ..... 2. NO .....

43. Are village leaders officially involved in Extension?

1. YES ..... 2. NO .....

44. Do you organize and work with vollage youth clubs for purposes of Extension?

1. YES ..... 2. NO .....

45. How much influence do you think the following categories of people have on Extension policy decisions and planning?

Categories	None	Some influence	Great influence
Chief Extension (Technical) Officer	.....	.....	.....
Zonal Extension Officer	.....	.....	.....
Development Officer	.....	.....	.....
Agric. Instructors (AIs)	.....	.....	.....
Farmers/farmers' Organizations	.....	.....	.....
Rural Women	.....	.....	.....
Rural Youth Clubs	.....	.....	.....

46. Is Extension organized along specific programs/activities?

1. YES ..... 2. NO .....

47. If yes, what are the programs/activities?

.....

.....

.....

.....

48. Are the programs/activities organized (or phased out) along specific time periods?

1. YES ..... 2. NO .....

49. If yes, explain.....

.....

.....

50. Do you always have your written work programme, i.e., calendar of work?

1. YES ..... 2. NO .....

51. When you took up Extension job were your responsibilities (duties) made known to you?

1. YES ..... 2. NO .....

52. If yes, in what way?

1. By individual briefings from my superior .....
2. By lectures .....
3. By written letters, circulars, pamphlets, etc. .....
4. By on-the-job experience .....

53. Were the responsibilities of your junior and senior officers officially made known to you?

1. YES ..... 2. NO .....

54. Would you say that supervision on your work by your supervisors is

1. Adequate?..... 3. Inadequate?.....

55. How many in-service courses have you attended? ..... Where?.....

56. What are your responses to the following statements?

a. Your promotion depends on how much Extension work you do.

1. YES 2. NO

b. There are enough Extension workers in the state.

1. AGREE 2. DISAGREE

c. The Extension workers in the state have adequate qualifications and skills

1. AGREE 2. DISAGREE

d. Generally, conditions of work in Extension are good

1. AGREE 2. DISAGREE

57. At the village level, do you maintain any official working relationship (cooperation) with other government workers?

1. YES 2. NO

58. If yes, explain.....
.....
.....

59. Would you say that the village Chiefs and Council members usually facilitate or hinder your Extension activities?.....
.....

60. Do you think that certain people benefit from Extension activities more than others or the people benefit equally?

    1) Unequal benefit .....
    2) Equal benefit .....

61. Among the following who do you think benefit more from Extension activities? Rank-order them (1st, 2nd, 3rd, and 4th) according to the amount of benefits received by each group.

	Rank
1) The village Chief and his Council members.....	_____
2) The rich farmers.....	_____
3) The average farmers.....	_____
4) The poor or small farmers.....	_____

62. What are some of these benefits?.....
.....
.....
.....

63. Among the following, who do you think has more access to Extension information activities? Rank-order them (1st, 2nd, 3rd, and 4th) according to the degree of access by each group.

	Rank
1) The village Chief and his Council members.....	_____
2) The rich farmers.....	_____
3) The average farmers.....	_____
4) The poor/small farmers.....	_____

Characteristics of Innovations

64. Please name below new or improved farm practices or inputs that have the following characteristics

Characteristics	Name of practice/input
Practices or inputs that solve some of the farmers' farm problems	1._____ 2._____ 3._____ 4._____
Practices or inputs that do not solve some of the farmers' farm problems	1._____ 2._____ 3._____ 4._____

Characteristics	Name of practice/input
Practices or inputs which most farmers can afford to purchase or hire	1._____ 2._____ 3._____ 4._____
Practices or inputs which most farmers cannot afford to purchase or hire	1._____ 2._____ 3._____ 4._____
Practices or inputs which most farmers find easy to use	1._____ 2._____ 3._____ 4._____
Practices or inputs which most farmers find difficult to use	1._____ 2._____ 3._____ 4._____
Practices or inputs which most farmers find profitable to use	1._____ 2._____ 3._____ 4._____
Practices or inputs which most farmers find unprofitable to use	1._____ 2._____ 3._____ 4._____
Practices or inputs which fit well with the traditional practices or tastes	1._____ 2._____ 3._____ 4._____
Practices/inputs which do not fit well with the traditional practices or tastes	1._____ 2._____ 3._____ 4._____

Agents' Attitude to Farmers

65. Could you please respond to the following statements?

1. Working with farmers is not interesting

Agree 1 Undecided 2 Disagree 3

2. Working and living in a rural area is preferable to working and living in an urban area

Agree 3 Undecided 2 Disagree 1

3. Rural people do not learn anything

Agree 1 Undecided 2 Disagree 3

4. An Extension worker should not be concerned with the overall welfare of rural people

Agree 1 Undecided 2 Disagree 3

5. Farmers are quick in adopting new ideas, practices and products

Agree 3 Undecided 2 Disagree 1

6. Farmers prefer group production to individual production of crops

Agree 3 Undecided 2 Disagree 1

7. Rural people have no personal motivation to seek new ways of improving their traditional farming practices

Agree 1 Undecided 2 Disagree 3

8. Farmers would borrow money or take credit for their farm operations when it is available

Agree 3 Undecided 2 Disagree 1

66. Finally, what would you say are the major problems being experiences in Extension?

.....

.....

.....

.....

67. And, could you suggest possible solutions to these problems?

.....

.....

.....

.....

Thank you.

APPENDIX B.

CORRELATIONS AND REGRESSIONS

Table B.1. Zero-order correlations of the study variables

Variable[a]		Y_1	Y_2	Y_3	Y_4	X_1	X_2
Y_1	PERC	--					
Y_2	CONS	.211**	--				
Y_3	PERF	.324***	.210**	--			
Y_4	IMPACT	.214**	.385***	.210**	--		
X_1	AGE	.043	.027	.251***	-.170**	--	
X_2	EDUC	.101	.136*	.082	-.138*	.349***	--
X_3	TRAIN	.179**	.062	.115	.081	.339***	.160*
X_4	TENURE	.035	.093	.079	-.153*	.495***	.199**
X_5	RANK	.101	.167**	.193**	-.151*	.433***	.704***
X_6	JOBSAT	-.019	.047	.045	.154*	-.121	-.218**
X_7	ATT	-.066	-.011	-.001	-.100	.127*	.047
X_8	DMAKING	.228***	.169**	.272***	.192**	.030	-.052
X_9	PLANNIN	.100	.578***	.242***	.199**	.119	-.005
X_{10}	PERSONL	.038	.593***	.042	.098	.142*	.228***

[a]The variables are named on page 88.

*Significant, p<.10.

**Significant, p<.05.

***Significant, p<.01.

X_3	X_4	X_5	X_6	X_7	X_8	X_9	X_{10}
--							
.379***	--						
.086	.359***	--					
.093	-.124*	-.204**	--				
-.006	.166**	.251***	-.038	--			
.070	.033	-.059	.201**	-.065	--		
.111	.091	.110	-.080	.118	.143*	--	
.050	.187**	.252***	.057	-.184	-.000	.261***	--

Table B.2. Partial regression coefficients and F-tests for the independent variables in the initial model

Dependent variable[a]	Independent variable[a]		B	β	F-value	Sig. level
PERF (Y_3)	AGE	(X_1)	.084	.245	5.013	.027
	EDUC	(X_2)	-.286	-.125	.927	.338
	TRAIN	(X_3)	-.022	-.010	.010	.919
	TENURE	(X_4)	-.046	-.085	.598	.442
	RANK	(X_5)	.271	.225	2.573	.112
	JOBSAT	(X_6)	.085	.064	.458	.500
	ATT	(X_7)	-.078	-.079	.656	.420
	DMAKING	(X_8)	.163	.165	3.126	.080
	PLANNIN	(X_9)	.394	.134	1.430	.235
	PERSONL	(X_{10})	-.291	-.132	1.219	.272
	PERC	(Y_1)	.295	.235	6.335	.013
	CONS	(Y_2)	.042	.110	.661	.418
CONS (Y2)	AGE	(X_1)	-.109	-.122	2.310	.132
	EDUC	(X_2)	.541	.091	.901	.345
	TRAIN	(X_3)	-.112	-.020	.071	.790
	TENURE	(X_4)	.018	.013	.024	.877
	RANK	(X_5)	-.102	-.033	.098	.755
	JOBSAT	(X_6)	.160	.046	.437	.510
	ATT	(X_7)	.151	.059	.674	.414
	DMAKING	(X_8)	.196	.076	1.234	.269

[a]The variables are named on page 88.

Table B.2. Continued

Dependent variable[a]	Independent variable[a]	B	β	F-value	Sig. level
	PLANNIN (X_9)	3.380	.443	39.577	.000
	PERSONL (X_{10})	2.785	.483	42.850	.000
	PERC (Y_1)	.452	.139	4.166	.044
PERC (Y1)	AGE (X_1)	-.018	-.066	.318	.574
	EDUC (X_2)	.009	.005	.001	.973
	TRAIN (X_3)	.340	.198	3.316	.072
	TENURE (X_4)	-.029	-.067	.316	.575
	RANK (X_5)	.144	.150	.982	.324
	JOBSAT (X_6)	-.070	-.066	.415	.521
	ATT (X_7)	-.062	-.079	.564	.454
	DMAKING (X_8)	.180	.228	5.396	.022
	PLANNIN (X_9)	.116	.050	.231	.632
	PERSONL (X_{10})	-.022	-.012	.013	.909

Table B.3. Partial regression coefficients and F-tests for the independent variables in the revised model

Dependent variable[a]	Independent variable[a]	B	β	F-value	Sig. level
PERF (Y_3)	AGE (X_1)	.080	.233	7.312	.008
	DMAKING (X_8)	.201	.204	5.313	.023
	PERC (Y_1)	.336	.268	9.151	.003
CONS (Y_2)	PLANNIN (X_9)	3.353	.440	44.396	.000
	PERSONL (X_{10})	2.721	.472	51.639	.000
	PERC (Y_1)	.487	.149	5.494	.021
PERC (Y1)	TRAIN (X_3)	.281	.164	3.154	.079
	DMAKING (X_8)	.170	.216	5.508	.021

[a]The variables are named on page 88.

Table B.4. Coefficients of determination and F-tests for the dependent variables in the initial model

Dependent variable	R^2	Adjusted R^2	Standard error	F-value	Sig. level
PERF (Y_3)	.260	.171	2.725	2.905	.002
CONS (Y_2)	.590	.545	5.249	13.074	.000
PERC (Y_1)	.109	.020	2.361	1.231	.281

Table B.5. Coefficients of determination and F-tests for the dependent variables in the revised model

Dependent variable	R^2	Adjusted R^2	Standard error	F-value	Sig. level
PERF (Y_3)	.200	.178	2.713	9.019	.000
CONS (Y_2)	.566	.553	5.199	46.849	.000
PERC (Y_1)	.079	.062	2.310	4.645	.012